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I.—*Materials for a Flora of the Malay Peninsula.*—By GEORGE KING, M. B.,
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No. 4.

As explained in No. 1 of these papers, I was unable to take up the Natural Family of Anonaceæ in its natural sequence. Having now been able to work it out, I present my account of it to the Society. Another of the *Thalamifloral* families (*Dipterocarpeæ*) still remains to be worked out before beginning the *Discifloræ*. In the present paper I have followed, for the most part, the arrangement of tribes and the limitations of genera adopted by Sir J. D. Hooker in his *Flora of British India*; and in most of the instances where I have not done so the fact has been noted.

ORDER IV. ANONACEÆ.

Trees or shrubs, often climbing and aromatic. *Leaves* alternate, exstipulate, simple, quite entire. *Flowers* 2- rarely 1-sexual. *Sepals* 3, free or connate, usually valvate, rarely imbricate. *Petals* 6, hypogynous, 2-seriate, or the inner absent. (*Flowers* dimerous in *Disepalum*). *Stamens* many, rarely definite, hypogynous, closely packed on the torus, filaments short or 0; anthers adnate cells extrorse or sublateral, connective produced into an oblong dilated or truncate head. *Ovaries* 1 or more, apo-

carpous, very rarely (*Anona*) syncarpous with distinct or agglutinated stigmas, style short or 0; ovules 1 or more. *Fruit* of 1 or more, sessile or stalked, 1- or many-seeded, usually indehiscent carpels. *Seeds* large; testa crustaceous or coriaceous; albumen dense, ruminant, often divided almost to the axis into several series of horizontal plates; embryo small or minute, cotyledons divaricating.—*Distrib.* Tropics of the Old World chiefly; genera about 45 with 500 or 600 species.

Tribe I. UVARIÆ. *Petals* 2-seriate, one or both series imbricate in bud. *Stamens* many, close-packed; their anther-cells concealed by the overlapping connectives. *Ovaries* indefinite.

Sepals imbricate; trees or shrubs.

Flowers small, globular, scarcely opening; often uni-sexual and from the older branches or trunk; ovules 6 to 8, or indefinite.

Trees; flowers 1-sexual; ovules many; torus conical or hemispheric 1. *Stelechocarpus*.

Trees or shrubs; flowers unisexual or hermaphrodite; ovules 6 to 8; torus flat 2. *Sageraea*.

Sepals valvate; climbers.

Flowers small, mostly hermaphrodite; petals incurved, ovules 6 to 8; torus flat 3. *Cyathostemma*.

Flowers usually large and from the leafy branches, petals spreading; torus flat.

Flowers 2-sexual; ovules many ... 4. *Uvaria*.

Flowers 1- or 2-sexual; ovules solitary, rarely 2 5. *Ellipeia*.

Tribe II. UNONEÆ. *Petals* valvate or open in bud, spreading in flower, flat, or concave at the base only; inner subsimilar or 0. *Stamens* many, close-packed; their anther-cells concealed by the overlapping connectives. *Ovaries* indefinite.

Flowers trimerous.

Petals conniving at the concave base and covering the stamens and ovaries.

Ovaries 1-3, many-ovuled; peduncles not hooked 6. *Cyathocalyx*.

- Ovaries many, 2-ovuled : peduncles
hooked 7. *Artabotrys*.
Ovaries many ; ovules 4 or more ;
peduncles straight 8. *Drepananthus*.

Petals flat, spreading from the base.

- Ripe carpels indehiscent.
Ovules many, 2-seriate ; petals
lanceolate, stamens with acute
apical appendage 9. *Canangium*.
Ovules 2-6, 1-seriate on the
ventral suture 10. *Unona*.
Ovules 1-2, basal or subbasal... 11. *Polyalthia*.
Ripe carpels follicular 12. *Anaxagorea*.
Flowers dimerous 13. *Disepalum*.

Tribe III. MITREPHOREÆ. *Petals* valvate in bud, outer spreading ; inner dissimilar, concave, connivent, arching over the stamens and pistils, (divergent in some *Mitrephoras*). *Stamens* many, (few in *Orophea*), closely packed ; anther-cells (except in *Orophea*) concealed by the overlapping connectives. *Pistils* numerous (few in some *Oropheas*).

Inner petals clawed.

- Inner petals connivent in a cone, but
not vaulted 14. *Goniothalamus*.

Inner petals vaulted,

- Stamens about 6, Miliusoid ; inner
petals longer than the outer 15. *Orophea*.
Stamens numerous, Uvarioid ; inner
petals not longer or very little
longer than the outer 16. *Mitrephora*.

Inner petals not clawed.

- Flowers globose ; petals subequal 17. *Popowia*.
Flowers elongate ; inner petals much
shorter than the outer 18. *Oxymitra*.

Tribe IV. XYLOPIÆ. *Petals* valvate in bud, thick and rigid, connivent ; the inner similar but smaller, rarely 0.

- Outer petals broad ; torus convex 19. *Melodorum*.
Outer petals narrow, often triquetrous ;
torus flat or concave 20. *Xylopia*.

Tribe V. MILIUSEÆ. *Petals* valvate in bud, the

outer sometimes very small like the sepals. *Stamens* often definite, loosely imbricate; anther-cells (except in *Phceanthus*) not concealed by the connectives. *Ovaries* solitary or indefinite.

Ovaries indefinite.

Sepals and outer petals similar and minute; inner petals very large, often cohering by their edges.

Ovules 1 or 2: stamens numerous, quadrate, with broad truncate apical processes concealing the anther-cells from above ... 21. *Phceanthus*.

Ovules 1 or 2, rarely 3 or 4; stamens few or numerous, compressed, the apical process of the connective compressed, not broad or truncate, and not concealing the anther-cells from above ... 22. *Miliusa*.

Petals larger than the sepals, often saecate at the base, subequal or the inner smaller 23. *Alphonsea*.

Ovaries solitary.

Outer petals valvate, inner imbricate ... 24. *Kingstonia*.

All the petals valvate ... 25. *Mezzettia*.

1. STELECHOCARPUS, Blume.

Trees. *Leaves* coriaceous. *Flowers* diœcious, fascieled, on the old wood. *Sepals* 3, small, elliptic or orbicular, imbricate. *Torus* conical. *Stamens* indefinite; connective dilated, truncate. *Ovaries* indefinite, ovoid; stigma sessile; ovules 6 or more. *Ripe carpels* large, berried, globose, 4-6-seeded.—Distrib. Species 3 or 4, all Malayan.

Leaves pellucid-punctate ... 1 *S. punctatus*.

Leaves not pellucid-punctate.

Flowers of both sexes alike ... 2 *S. nitidus*.

Male flowers smaller than the female ... 3 *S. Burahol*.

1. STELECHOCARPUS PUNCTATUS, King n. sp. A tree 20 to 30 feet high: young branches slender, cinereous-puberulous, becoming glabrous. *Leaves* membranous, minutely pellucid-punctate, elliptic-ovate, shortly acuminate, slightly narrowed in the lower fourth to the rounded sub-oblique base: upper surface shining, glabrous except the pubescent impressed midrib; lower surface shining, paler than the upper, sparsely puberulous or glabrous, the reticulations minute and distinct: main nerves 12 to 14 pairs, bold and prominent on the lower, slightly impres-

sed on the upper, surface: length of blade 7 to 10 in., breadth 3 to 4 in.; petiole .15 to .2 in., stout, pubescent. *Male flowers* in several-flowered fascicles from woody tubercles on the trunk, pedunculate: buds turbinate, nearly .5 in., in diam.; peduncles 1 to 1.5 in. long, stout, thickened upwards, ebracteolate, puberulous. *Sepals* very coriaceous, rotund, concave, conjoined at the base, spreading, rugose, pubescent outside, glabrous inside. *Petals* very coriaceous, rotund, concave, glabrous; the outer 3 puberulous outside; the inner three smaller than the outer, quite glabrous, otherwise like them and all of a dark brownish colour. *Anthers* sessile, flat, the cells elongate on the anterior surface, the back striate: apex without any appendage from the connective. *Female flowers* and *fruit* unknown.

Perak; King's Collector, No. 7183.

Although female flowers and fruit of this have not yet been found, I describe it as a new species of *Stelechocarpus* without any hesitation. Its male flowers have exactly the facies of those of *S. Burahol*, Bl.; but they are larger. They, however, differ as to shape of petals; the leaves of this species are distinctly pellucid-punctate (while those of *S. Burahol* are not) and they are broader and have slightly more nerves than those of *S. Burahol*. When boiled, the flowers of the two have exactly the same peculiar sweetish smell.

2. *STELECHOCARPUS NITIDUS*, King, n. sp. A tree 30 to 60 feet high; all parts glabrous except the inflorescence: young branches darkly cinereous, slender. *Leaves* coriaceous, oblong-lanceolate, shortly acuminate, the base acute; both surfaces shining, very minutely scaly, the midrib and nerves deeply impressed on the upper, bold and prominent on the lower; the reticulations distinct on both: main nerves 10 to 12 pairs, curved, sub-ascending, inter-arching within the edge: length of blade 6 to 9 in., breadth 1.8 to 3.25 in., petiole .35 in. *Male flowers* in many-flowered fascicles from tubercles on the trunk, pedicellate; buds turbinate; flowers when open probably nearly 1 in. in diam.: pedicels stout, thickened upwards, 1 to 1.5 in. long, scurfy-puberulous, each with several sub-rotund glabrous bracteoles mostly near its base. *Sepals* very coriaceous, shortly oblong, obtuse, concave, spreading, conjoined at the base, puberulous or glabrescent, warted externally. Outer 3 petals much larger than the sepals and somewhat larger than the inner 3 petals, rotund, concave, very coriaceous, glabrous, with scurfy warts externally near the middle: inner 3 petals coriaceous, rotund, blunt, cucullate, glabrous. *Female flowers* like the males, stamens none: *Ovaries* very numerous, obscurely 3-angled, adpressed-sericeous. *Torus* hemispheric. *Ripe carpels* broadly ovoid, blunt, 2.5 in. long, 1.75 in. in diam., puberulous, minutely warted; pericarp thick, fleshy. *Seeds* about 8 in 2 rows, flattened, 1.25 in. long, and .5 in. thick.

Perak; in dense forest at low elevations, King's Collector, Nos. 7629 and 8224.

This species has the flowers of both sexes alike. The carpels of this species are much larger than those of *S. Burahol*, Bl.; and its leaves are more thickly coriaceous and shining, the nerves and midrib being much more depressed on the upper and prominent on the lower surface.

3. STELECHOCARPUS BURAHOL, H. f. and T. Fl. Ind. 94. A tree 20 to 60 feet high: young branches slender, dark-coloured, glabrous. *Leaves* thinly coriaceous, oblong-lanceolate, acute or very shortly acuminate, the base cuneate: both surfaces glabrous, shining, the reticulations minute and distinct, the lower with minute black dots, the upper with very minute scales; main nerves 10 to 12 pairs, sub-ascending, prominent, inter-arching .2 in. within the margin; length of blade 5 to 8 in.; breadth 1.75 to 2.75 in.; petiole .3 to .9 in. *Male flowers* much smaller than the female (only about .4 in. in diam.), in fascicles of 8 to 16 from minutely bracteolate woody tubercles from the branches and trunk, pedicellate; the pedicels slender, ebracteolate, tomentose, from .5 to .75 in. long. *Sepals* coriaceous, triangular, spreading. *Petals* much longer than the sepals, oblong, sub-acute, warted, pubescent inside: anthers with obtuse terminal, dilated, 2-lobed apical appendages from the connective; ovaries 0. *Female flowers* three times as large as the males, and on similar pedicels; calyx not persistent; corolla as in the male. *Ovaries* numerous, on an ovoid-conic torus, oval or obovate, the outer surface compressed, the inner with a vertical ridge and adpressed, pale hairs; stigma sessile, minutely lobed. *Fruit* on stout peduncles 2 to 3 in. long, thickened upwards. *Ripe carpels* few, shortly stalked, globose, obovate, about 1.5 in. long, and 1.25 in. in diam.; when young puberulous, verrucose, afterwards nearly smooth; pericarp pulpy, coriaceous externally. *Seeds* 4 to 6, large, oval, sub-compressed, sub-rugose. Hook. fil. Fl. Br. Ind. I, 47. *Uvaria Burahol*, Blume Bijdr. 14; Floræ Javæ Anon. 48, t. 23, and 25 C.; Scheff. in Nat. Tijdsch. Ned. Ind. XXXI, 5.

Singapore; Lobb. Distrib. Java.

There is sometimes a remarkable difference in the length of the petioles in this species, some of those on the same specimen being three times as long as others.

2. SAGERAEA, Dalz.

Trees. *Leaves* shining, and branches glabrous. *Flowers* small, axillary or fascicled on woody tubercles, 1-2-sexual. *Sepals* orbicular or ovate, imbricate. *Petals* 6, imbricate in 2 series, nearly equal, usually orbicular, very concave. *Stamens* 6-21, imbricate in 2 or more series,

broadly oblong, thick, fleshy; anther-cells dorsal, oblong; connective produced. *Ovaries* 3–6; style short, stigma obtuse or capitate; ovules 6 to 8, on the ventral suture. *Ripe carpels* globose or ovoid, stalked.—**DISTRIB.** Species 6, tropical Asiatic.

A genus closely allied to *Bocagea*, St. Hilaire, but differing from that in having its sepals and petals much imbricate instead of valvate; in bearing more ovules, and more seeds in its ripe carpels; in its anther-cells being more lateral and not so entirely dorsal as in *Bocagea*, and in the apical process of the connective being truncate. The flowers of *Sageraea* are small and the sepals and petals are very concave; and in these respects, as well in the comparative fewness of the seeds in their ripe carpels, they diverge from those of typical *Uvaria*. Hooker filius and Thomson (in their *Flora Indica*), Bentham and Hooker (in their *Genera Plantarum*), and Baillon (in his *Histoire des Plantes*, Vol. I, 202, 281) retain *Sageraea* as a genus,—an example which I would have followed without any hesitation had not Sir Joseph Hooker united it with *Bocagea* in his *Flora of British India*. The extreme imbrication both of the sepals and petals appears to me however, in spite of Sir Joseph Hooker's more recent view, so insurmountable an argument against its reduction to a genus in which both these sets of organs are very distinctly valvate, that I adhere to the earlier view that *Sageraea* should remain distinct and be put in the tribe *Uvaria*.

1. *SAGERAEA ELLIPTICA*, Hook. fil. and Thoms. Fl. Ind. 93. A large tree; all parts glabrous except the ciliate petals; young branches rather stout, angled. *Leaves* coriaceous, narrowly oblong, acute (obtuse, when very old); the base narrowed, obtuse or minutely cordate, oblique: both surfaces shining; main nerves 14 to 16 pairs, spreading, faint; length 8 to 12 in., breadth 2·25 to 3·5 in.; petiole ·15 in., very thick. *Flowers* monoecious, solitary and axillary, or fascicled on tubercles on the larger branches, small, red: pedicels ·25 in. long, with several basal and medial bracts. *Sepals* small, semi-orbicular, glabrous, ciliate. *Petals* thick, ovate-orbicular, concave, tubercular outside, glabrous, the edges ciliate, ·25 in. long; the inner smaller than the outer. *Stamens* 12 to 18, the connective sub-quadrate at the apex; anthers extrorse. *Ovaries* in female flower about 3, glabrous; ovules about 8. *Ripe carpels* sub-sessile, globose, glabrous, 1 in. in diam., seeds several. *Sageraea Hookeri*, Pierre Flore Forest. Coch-Chine t. 15. *Bocagea elliptica*, H. f. and Th. Fl. Br. Ind. I, 92; Kurz F. Flora Burma, I, 50. *Uvaria elliptica*, A. DC. in Mem. Soc. Genev. v. 27; Wall. Cat. 6470, 7421. *Diospyros? frondosa*, Wall. Cat. 4125.

Burmah to Penang.

An imperfectly known species, badly represented in collections.

3. CYATHOSTEMMA, Griffith.

Scandent shrubs. *Flowers* subglobose in di- or tri-chotomous pendulous cymes from the old wood (flowers dimorphous in sp. 3.) *Sepals* 3, connate, hirsute. *Petals* 6, 2-seriate, short, sub-equal, their bases fleshy, all valvate at the base, the tips imbricate. *Torus* flat, margin convex. *Stamens* many, linear; anthers sub-introrse; process of connective oblique, incurved. *Ovaries* many; style cylindric, glabrous, notched; ovules many. *Ripe carpels* oblong-ovoid, many-seeded.

The petals in this genus are so unmistakeably imbricate in æstivation, that I remove it from the tribe *Unoneæ* to *Uvariæ*. The ripe carpels moreover much resemble those of some species of *Uvaria*. Of the five species described below, three are quite new. The first (*C. viridiflorum*) is the plant upon which Griffith founded the genus; while the fourth has been hitherto referred to *Uvaria* under the specific name *U. parviflora*.

Flowers uniform and hermaphrodite.

- | | |
|---|-----------------------------|
| Flowers in more or less elongated pendent cymes | |
| Leaves oblong-lanceolate or oblanceolate; inner petals contracted at the base ... | 1. <i>C. viridiflorum</i> . |
| Leaves obovate-elliptic to obovate-oblong; petals not contracted at the base ... | 2. <i>C. Scortechinii</i> . |
| Flowers in stem-fascicles of 10 to 14, or in axillary pairs; leaves with pubescent midribs | 3. <i>C. Wrayi</i> . |
| Flowers in 2- or 3-flowered extra-axillary or leaf-opposed fascicles or cymes; leaves quite glabrous | 4. <i>C. Hookeri</i> . |
| Flowers dimorphous, the females with a few abortive anthers | 5. <i>C. acuminatum</i> . |

1. CYATHOSTEMMA VIRIDIFLORUM, Griff. Notulæ IV, 707: Ic. Pl. IV, t. 650. Scandent (?) the young branches thin, glabrous, dark-coloured when dry. *Leaves* coriaceous, oblong-lanceolate or oblanceolate, apiculate; the base slightly narrowed, minutely cordate: both surfaces rather dull; the upper glabrous except the minutely tomentose midrib; the lower darker, puberulous on the midrib and 8 to 10 pairs of rather prominent spreading main nerves; length 4·5 to 7·5 in., breadth 1·5 to 2 in., petiole ·2 in. *Cymes* dichotomous, on peduncles several inches long from warty tubercles on the older roughly striate branches, few-flowered, corymbose, minutely rusty-tomentose, with an oblong bract at each bifurcation and another about the middle of each pedicel. *Flowers* ·5 in. in diam. *Sepals* broadly cordate, spreading or sub-reflexed. *Petals* acute, the base contracted especially in those of

the inner row, coriaceous, tomentose. *Ovaries* tomentose. *Ripe carpels* stalked, 1 to 1·5 in. long, oblong-ovoid, blunt, glabrous; stalk ·75 in. Hook. fil. Fl. Br. Ind. I, 57; Kurz For. Fl. Burm. I, 33.

Eastern Peninsula; Griffith. Penang; Maingay (Kew Distrib.) No 36.

A species known by only a few imperfect specimens. According to Griffith, the wood of this species resembles that of a Menisperm. Kurz gives this as a native of the Andamans; but I have seen no specimen from those islands.

2. *CYATHOSTEMMA SCORTECHINII*, n. sp. King. A climber 50 to 70 feet long: branches of all ages, except the very youngest, dark-coloured, glabrous; the very youngest slender and rufous-pubescent. *Leaves* coriaceous, obovate-elliptic to obovate-oblong, shortly apiculate, slightly narrowed to the sub-cuneate, not cordate, base; upper surface rather dull, glabrous except the minutely pubescent midrib; lower glabrous, the midrib slightly muriculate, the reticulations fine, distinct: main nerves 8 to 11 pairs, prominent beneath: length 6 to 10 in., breadth 2·5 to 4 in., petiole ·25 in. *Cymes* di- or tri-chotomous, on pedicels 2 to 12 in. long from the older branches; minutely rufous-tomentose, bracteate in the upper half; the bracts numerous, ovate to rotund, concave. *Flowers* ·5 in. in diam. *Sepals* sub-rotund, united into an obscurely 3-angled flattish cup. *Petals* equal, not much longer than the stamens, sub-rotund, puberulous, coriaceous. *Connective of stamens* produced at the apex, obliquely truncate. *Ovaries* numerous, cylindric, pubescent: stigmas truncate: ovules numerous. *Ripe carpels* oblong, slightly oblique, apiculate, transversely furrowed, glabrous, shortly stalked, 1·25 to 1·5 in. long; pericarp thin. *Seeds* 8 to 10, flattened, ovoid, smooth.

Perak; Scortechini, King's Collector; No. 5357. Singapore: Ridley.

The specimens collected by the late Father Scortechini were referred by him to *Cyathostemma viridiflorum*, Griff., from which species however, this differs by its larger, more obovate, more glabrous, leaves; flat calyx-cup formed by the entirely connate sepals; more rotund petals, not contracted at the base; and narrower shorter-stalked fruit.

3. *CYATHOSTEMMA WRAYI*, King n. sp. A creeper 20 to 60 feet long: young branches rufous-puberulous, ultimately glabrous and darkly cinerous. *Leaves* membranous, broadly oblanceolate, shortly and rather obtusely acuminate, narrowed below the middle to the rounded base; both surfaces finely reticulate, the upper dull when dry, glabrous; the midrib minutely pubescent; lower surface shining, glabrous except the sparsely puberulous midrib; main nerves 8 to 9 pairs, oblique, forming double arches inside the margin, impressed on the upper, pro-

minent on the lower surface; length 7 to 9 in., breadth 2·5 to 3 in., petiole ·2 in. *Flowers* in fascicles of 10 to 14 from tubercles on the older branches, or in pairs from the axils of the leaves, sub-globular, about ·5 in. in diam.; pedicels ·25 to ·4 in. long, granular, sparsely pubescent and with a small ovate bracteole near the base. *Sepals* broadly ovate, spreading, rufous-puberulous and granular outside, glabrous inside, ·1 in. long. *Petals* concave, cartilaginous, slightly imbricate, minutely puberulous especially towards the edges; the outer row ovate-orbicular, sub-acute, ·35 in. long; the inner row smaller, thicker, blunter and more imbricate than the outer. *Stamens* numerous; the connective with a rather thick truncate, 4- or 5-sided apical process concealing the apices of the linear dorsal anthers. *Ovaries* numerous, obliquely oblong, curved, glabrous, pubescent at the base, 1 to 2-ovuled, with a conical, narrow, inflexed stigma. *Ripe carpels* reddish, ovoid, ·4 to ·6 in. long, glabrous, with a single ovoid or 2 plano-convex shining pale brown seeds: stalks about as long as the carpels, slender.

Perak; Scortechini, Wray, King's Collector.

4. *CYATHOSTEMMA HOOKERI*, King n. sp. A climber 40 to 80 feet long; all parts, except the inflorescence, quite glabrous. *Leaves* membranous, broadly oblanceolate to oblong or ovate-elliptic, acute or very shortly and obtusely acuminate, the base rounded or sub-cuneate; both surfaces shining, glabrous, minutely reticulate; main nerves 9 or 10 pairs, spreading or ascending, curving, inter-arching within the edge; length 5·5 to 7 in., breadth 2·25 to 2·75 in., petiole ·3 in. *Flowers* ·25 in. in diam., sub-globose, in extra-axillary or leaf-opposed fascicles or cymes of 2 or 3; pedicels slender, puberulous, ·3 to ·4 in long with 1 or 2 bracteoles. *Sepals* spreading, broadly and obliquely ovate, sub-acute, slightly thickened at the base, ·1 in. long. *Petals* concave; the outer row slightly longer than the sepals but narrower, obovate, contracted into a pseudo-claw at the base, sparsely puberulous outside; the inner row narrower, thicker, and more concave, oblique. *Stamens* numerous, short, with a thick incurved apical process from the connective; anther cells dorsal. *Ovaries* numerous, oblong, thickened upwards, puberulous; the stigma large, sub-quadrata, slightly 2-lobed. *Ripe carpels* numerous, oblong to ovoid, blunt at each end, glabrescent, ·75 to 1·75 in. long and ·6 to ·9 in. in diam.; stalk 1·5 to 2 in. stout. *Seeds* 6 in a single row, compressed, oblong, pale brown, shining. *Uvaria parviflora*, Hook. fil. and Thoms. Fl. Ind. 103; Fl. Br. Ind. I, 51.

Penang; Phillips, Curtis. Perak; Scortechini, Wray, King's Collector.

For upwards of seventy years this plant had been known only by Phillips' scanty specimens from Penang. In 1887 Mr. Curtis sent

flowering specimens of it, together with a single ripe carpel from the same island; while copious flowering and fruiting specimens were, about the same time, received from Perak. In all its parts the plant is essentially a *Cyathostemma*.

5. *CYATHOSTEMMA ACUMINATUM*, n. sp. King. A climber; branches pale brownish, the youngest slender, dark-coloured, rufous-puberulous. *Leaves* membranous, oblanceolate-oblong, caudate-acuminate, the base acute; both surfaces glabrous shining and minutely reticulate; the midrib depressed above and puberulous, beneath prominent and minutely muriculate: main nerves 10 to 11 pairs, spreading, curved, sub-ascending, prominent beneath, depressed above: length 8 to 9 in.; breadth 2·2 to 2·5 in.; petiole 1·5 in., tomentose. *Cymes of hermaphrodite flowers* rufous-pubescent, 4 to 6 in. long; pedicel about as long as the branches, the latter with numerous distichous, oblong, nervose bracts. *Flowers* 4 to 5 in. in diam., on short pedicels. *Sepals* triangular, blunt, spreading. *Petals* as in *C. Scortechinii*; connective of stamens forming at the apex a thick incurving point. *Ovaries* as in *C. Scortechinii* but with conical stigma. *Cymes of female flowers* much shorter than those of the hermaphrodite, dichotomous, few-flowered, about 1·5 in. long (of which the peduncle is 1 in.); slightly rufous-pubescent; bracts few, lanceolate. *Flowers* about 4 in. in diam. when open, buds conical. *Sepals* broadly triangular, cordate, acute, spreading, pubescent. *Petals* coriaceous, granular-pubescent, concave; the outer broadly ovate-triangular, the apex sub-acute, incurved in bud; the inner row smaller, narrower, erect, connivent. *Stamens* absent. *Ovaries* as in the hermaphrodite, but the stigma larger, and not conical.

Upper Perak; Wray No. 3468.

A remarkable species of which I have seen only Wray's incomplete specimens. These specimens are accompanied by some loose young carpels, ovate-globular, oblique, with persistent recurved styles, and a single or at most two seeds. If these carpels really belong to the specimen, the definition of the genus will have to be modified. The structure of both the hermaphrodite and pistillate flowers agrees perfectly with that of the other species above described.

4. *UVARIA*, Linn.

Scandent or sarmentose shrubs, usually stellately pubescent. *Flowers* terminal or leaf-opposed, rarely axillary, cymose, fascicled or solitary, yellow, purple or brown. *Sepals* 3, often connate below, valvate. *Petals* 6, orbicular, oval or oblong, imbricate in 2 rows, sometimes connate at the base. *Stamens* indefinite; top of connective ovoid-oblong, truncate or subfoliaceous. *Torus* depressed, pubescent or tomentose. *Ovaries* in-

definite, linear-oblong; style short, thick; ovules many, 2-seriate, rarely few or 1-seriate. *Ripe carpels* many, dry or berried, few- or many-seeded.—*DISTRIB.* About 110 species—many tropical Asiatic, a few African species, and some Australian.

A genus characterised by the usually large showy flowers with imbricate Rosaceous corolla:—allied to the American genus *Guatteria* Ruiz and Pavon (*Cananga*, Aubl.) and distinguished from it chiefly by its multi-ovulate ovaries.

Flowers more than .5 in. in diam.

Connective of anthers slightly produced at the apex, compressed, oblique.

Carpels stalked, oblong, rugulose ... 1. *U. Larep.*

Carpels ovoid to sub-globular.

Carpels 1.5 to 2.25 in. long, not tuberculate, very pulpy, tomentose ... 2. *U. Hamiltoni.*

Carpels not more than 1 in. long, tubercular, with little pulp.

Carpels ovoid, oblique; leaves woolly-tomentose beneath, even when old ... 3. *U. dulcis.*

Carpels globular or globular-ovoid, leaves glabrous when adult ... 4. *U. Lobbiana.*

Connective produced beyond the apex to about half the length of the anther, flattened, obliquely truncate; flower 1.5 in. in diam. ... 5. *U. macrophylla.*

Connectives produced, those of the inner anthers truncate, those of the outer flattened and oblique: flower 2 to 3 in. in diam.; leaves conspicuously stellate-tomentose beneath ... 6. *U. purpurea.*

Connectives of anthers slightly, or not at all, produced at the truncate apex.

Whole plant stiffly hairy 7. *U. hirsuta.*

Whole plant softly hairy... .. 8. *U. Curtisii.*

Connectives of anthers produced into a broad flattened sub-quadrate process; the outer anthers changed into staminodes ... 9. *U. Ridleyi.*

Anthers oblong-cuneate, the connectives produced at the apex and always truncate.

Leaves pubescent beneath.

Flowers in terminal umbellate racemes 10. *U. pauci-ovulata.*

Flowers in terminal umbels or in

- many-flowered lateral narrow
 panicles... .. 11. *U. Scortechinii.*
- Leaves glabrous except the midrib, 2·5 to
 5 in. long; flowers less than ·5 in. in
 diam. 12. *U. micrantha.*
- Flowers small (less than ·5 in. in diam.)
 Leaves glabrous except the midrib ... 12. *U. micrantha.*
 Leaves pubescent.
 Leaves on under-surface stellate rufous-
 pubescent; young branches and flow-
 ers outside with scurfy rufous tomen-
 tum 13. *U. andamanica.*
 Leaves on under surface and young
 branches minutely tawny-tomentose .. 14. *U. excelsa.*
- Species of doubtful position.
 Probably near *U. Lobbiana* 15. *U. astrostricta.*
 With axillary flowers 16. *U. sub-repanda.*

1. UVARIA LAREP, Miq. Fl. Ind. Bat. Suppl. 370. A climber 20 to 40 feet long: youngest branches and petioles sparsely covered with minute scaly stellate hairs; the older cinereous, lenticellate, glabrescent. *Leaves* membranous, elliptic or sub-obovate-elliptic, shortly acuminate, slightly narrowed in the lower fourth to the rounded sub-emarginate, not cordate, base: upper surface glabrous, shining, the midrib minutely tomentose; lower surface with a few short spreading hairs on the midrib and some of the nerves, otherwise almost glabrous; main nerves 10 to 12 pairs, spreading, interarching within the edge, bold in the lower, impressed on the upper, surface; length of blade 5 to 8 in., breadth 2 to 3 in., petiole ·2 to ·3 in. *Peduncles* from half-way between the leaves, ·1 in. long, 1- to 2-flowered (one of the flowers often abortive), warty and yellowish-pubescent; pedicels ·75 in. long, with 1 or 2 reniform bracts: flowers 1·5 to 1·75 in. in diam. *Sepals* small, (·2 in. long) reniform, united at the base, reflexed, pubescent. *Petals* oblong-oblancheolate, sub-acute, about ·75 in. long, sub-coriaceous, puberulous. *Anthers* sessile in very few rows, flattened; the connective slightly produced, flattened, oblique. *Ovaries* numerous, angled, puberulous, with a few long projecting hairs near the apex. *Torus* of the fruit small, sub-globular, pubescent. *Ripe carpels* numerous, stalked, cylindrical-oblong, oblique, curved, slightly apiculate, rugulose, minutely rufous-pubescent, 1·25 to 1·5 in. long, and ·5 in. in diam. *Seeds* about 10, in 2 rows, compressed, shining. *Stalks* 1·25 to 1·5 in. long, rufous-tomentose.

Perak: King's Collector, No. 4011, Wray No. 1826.

2. UVARIA HAMILTONI, Hook. fil. and Thoms. Fl. Ind. 96. A

powerful climber: young branches slender, softly rufous-tomentose, becoming glabrous. *Leaves* membranous, elliptic-oblong to elliptic, sometimes slightly obovate, acuminate; the base narrowed or rounded, sometimes slightly unequal, never cordate; upper surface adpressed-pubescent, almost glabrous when old, the midrib minutely rufous-tomentose; lower surface softly stellate-tomentose; main nerves 14 to 17 pairs, spreading, rather prominent beneath; length of blade 4 to 8 in., breadth 2·25 to 3·5 in., petiole ·15 to ·2 in. *Peduncles* solitary or 2 to 3 together, ·75 to 1·75 in. long, extra-axillary, 1-flowered; flowers 1·5 to 2·5 in. in diam.: bract single, sub-orbicular, rufous-tomentose outside, shortly hispid inside: buds turbinate, tomentose. *Sepals* broadly triangular, ultimately reflexed, membranous. *Petals* much longer than the sepals, coriaceous, obovate, the apices obtuse and incurved, minutely tomentose on both surfaces, brick-red. *Anthers* sub-sessile, equal, obliquely truncate at the apex, ·15 to ·2 in. long. *Ovaries* slightly shorter than the stamens, compressed, pubescent. *Torus* hemispheric, tomentose, pitted when adult. *Ripe carpels* on long slender stalks, ovoid to sub-globular, about 1·5 in. long, and 1 in. in diam. when fresh, tomentose, scarlet; when dry slightly constricted between the seeds; stalks slender, tomentose, 1 to 1·5 in. long. *Seeds* about 6, flat, shining. Hook fil. Fl. Br. Ind. I, 48. *U. grandiflora*, Wall. Cat. 6485 E

In the Forests at the base of the Eastern Himalaya; Madhopore Forest in E. Bengal: Assam; Khasia; Shan Hills (Prazer).

Var. *Kurzii*, King. Leaves with broader bases often minutely cordate; fewer nerves (12 to 14 pairs); smaller flowers (1·3 in. in diam.) on shorter pedicels (1 to 1·25 in.); petals yellowish, ovate-oblong.

South Andaman: Kurz, Kings' Collector.

This was referred by Kurz who first collected it, to *U. macrophylla*, Roxb., then to *U. purpurea*, Bl.: but was finally considered by him as "altogether doubtful." The fuller materials recently received show it to be, in my opinion, a very distinct variety of *U. Hamiltoni*, allied no doubt to *U. purpurea*, Bl., but a much larger plant with smaller flowers and more globular fruit.

3. *UVARIA DULCIS*, Dunal Anon. 90, t. 13. A powerful creeper often 80 to 100 feet long; youngest branches softly cinereous-tomentose; the older sub-glabrous or glabrous, dark-coloured, rather rough. *Leaves* coriaceous, elliptic or oval, sometimes unequal-sided, acute or sub-acute; the base broad, rounded, or sub-truncate, minutely cordate; upper surface sparsely adpressed-stellate-pubescent. The midrib ferruginous-tomentose; lower surface densely sub-ferruginous or cinereous woolly-tomentose; main nerves 8 to 10 pairs, spreading, slightly curving, prominent beneath: length of blade 4·5 to 7 in., breadth 2·5 to 3·5 in.,

petiole .2 in., stout. *Peduncles* .5 in. long, lateral, not axillary, 1-flowered, solitary or 2 to 3 together, each bearing a small ovate deciduous bract; buds ovoid-globose, tomentose; flowers 1.25 to 1.5 in. in diam. *Sepals* broadly triangular, sub-acute, slightly reflexed, fleshy, tomentose on both surfaces. *Petals* much longer than the sepals, sub-coriaceous, broadly ovate, sub-acute, sub-reflexed, minutely tomentose on the outer surface; pubescent on the inner. *Stamens* and *pistils* forming a compact hemispheric mass; anthers sub-sessile, .1 in. long, the connective much produced at the apex, compressed, oblique. *Ovaries* numerous, densely crowded, slightly shorter than the stamens, tomentose. *Torus* depressed-hemispheric, stellate-tomentose, pitted when adult. *Ripe carpels* numerous, stalked, ovoid, oblique, blunt, much and unequally tuberculate, densely and loosely ferruginous stellate-tomentose as are the 1 in. long stalks. DC. Prod. I, 88; Hook. fil. and Th. Fl. Ind. 98; Miq. Fl. Ind. Bat. I, Pt. 2, p. 24; Ann. Mus. Lugd. Bat. II, 8. *U. javana*, Dunal Anon. 91, t. 14; Blume Bijdr. 12; Fl. Javæ t. 3 and 13 B.; DC. Prod. I, 88? *U. aurita* Blume Fl. Javæ t. 3

Malacca, Griffith; Maingay (Kew Distrib.), No 25. Perak, King's Collector. Penang, Curtis, No. 1414.

As regards the size of its leaves and the colour of its flowers (which appear to vary from green though yellow to purple) this is rather a variable species. One of its forms, barely distinguishable from the type, was named *U. javana* by Dunal who also gave a figure of it. Blume, who again figured *U. javana*, distinguished it from *U. dulcis* by the stellate (not simple) hairs on the upper surface of its leaves. But, as Hook. fil. and Th. point out (Fl. Ind. 98), both kinds of hairs occur on the same leaf. In all the specimens named *U. javana*, received from the Dutch Botanists, the leaves are much smaller and less densely woolly below than those collected in the Malay Peninsula. Miquel suggests that *U. aurita*, Bl. is only a form of this. By neither figuring nor describing the fruit of what he understood as *U. dulcis*, *aurita* and *javana*, Blume neglected one of the best characters in this rather perplexing genus; and it may be that when fruit of the small-leaved Java species issued from the Herbarium of Buitenzorg shall be forthcoming, the reductions above made will have to be cancelled.

4. *UVARIA LOBBIANA*, H. f. and T. Fl. Ind. 100. A powerful climber, often reaching 100 to 150 feet in length: young branches pubescent, ultimately glabrous and dark-coloured. *Leaves* sub-coriaceous, oblong or oblong-ob lanceolate, acute or very shortly acuminate, rarely obtuse, narrowed to the rounded or sub-cordate base; both surfaces when very young stellate furfuraceous, speedily becoming glabrous except the puberulous midrib; the upper (when dry) pale green, the lower brown: main

nerves 13 to 16 pairs, curving slightly, spreading below, suberect above, thin but prominent beneath; length of blade 4 to 7 in., breadth 1·5 to 2·25 in., petiole ·25 in. *Peduncles* only ·25 in. long or even less, terminal or leaf-opposed, 2- or 3-flowered, tomentose, each flower with a large rotund amplexicaul bract; buds depressed-globose, tomentose: flower 1 to 1·2 in. in diam. *Sepals* conjoined into a wavy cup, tomentose outside, minutely pubescent inside. *Petals* coriaceous, often 7 or 8, slightly unequal, broadly oval, obovate, blunt; slightly warty on both surfaces, minutely tomentose on the outer, pubescent on the inner. *Anthers* sessile, flattened, ·1 in. long, the connectives produced at the apices, compressed, obliquely truncate, the outer row sterile. *Ovaries* 4-angled, pubescent except the truncate lobulate stigma. *Ripe carpels* numerous, stalked, globular or globular-ovoid, slightly oblique, boldly tubercled, pubescent, ·5 to ·75 in. in diam., and sometimes 1 in. long; pericarp thin; stalks slender, 1·5 to 2 in. long, glabrescent. *Seeds* 4 to 10, large, plano-convex, smooth. Miq. Fl. Ind. Bat. I, Pt. 2, 34: Hook. fil. Fl. Br. Ind. I, 49.

Malacca; Griffith, Maingay (Kew Distrib.), Nos. 27 and 30. Singapore and Perak; King's Collector. Penang; Curtis. Sumatra; Forbes, No. 3059.

5. *UVARIA MACROPHYLLA*, Roxb. Fl. Ind. II, 663. Scandent usually to the extent of 15 to 20 feet, but sometimes reaching 50 or 60 feet; young branches and petioles rusty-tomentose. *Leaves* coriaceous, elliptic-oblong, rarely elliptic-rotund, sometimes slightly obovate, obtuse or shortly and abruptly acuminate, very slightly narrowed to the rounded or minutely cordate base; upper surface (when adult) glabrescent or glabrous except the tomentose midrib and nerves; lower with lax, sometimes stellate, rusty tomentum, especially along the midrib and 11 to 18 pairs of prominent spreading or oblique nerves: length of blade 4·5 to 10 in., breadth 2·5 to 4 or (in some Burmese specimens) even 6 in.; petiole ·25 in. *Peduncles* extra-axillary or terminal, densely rusty-tomentose, 3- to 5-flowered, each pedicel with an oval or rounded bract; buds globose: flowers 1·5 in. in diam. *Sepals* connate into a cup with wavy obscurely 3-toothed edge. *Petals* much larger than the calyx, subrotund, blunt, coriaceous, purple, tomentose outside, pubescent inside; anthers sessile, ·3 in. long: the connective produced at the apex to nearly half the length of anther, compressed, obliquely truncate. *Ovaries* narrow, compressed, tomentose, the stigmas truncate, *Torus* of fruit woody, hemispheric, 1 in. in diam. sparsely pubescent, pitted. *Ripe carpels* stalked, oblong, blunt at each end, glabrous, ·75 to 1·25 in. long, pericarp thin; stalks ·5 to 1 in. long: seeds numerous, oval, compressed, shining. Wall. Pl. As. Rar. t. 122; Cat. 6487 (excl. F. in fruit) Hk. f.

and Th. Fl. Ind. 97; Hook. fil. Fl. Br. Ind. I, 49; Miq. Fl. Ind. Bat. I Pt. 2, p. 23; Thwaites Enum. Pt. Ceyl. 6; Kurz Fl. Burm. I, p. 28; Beddome Ic. Pl. Ind. Or. t. 81. *U. rufescens*, DC. Mem. Anon. 26. *U. cordata*, Wall. Cat. 6486. *Gutteria cordata*, Dunal Anon. 129 t. 30; DC. Prod. I, 93.

Silhet, Chittagong, Burmah, Malayan Peninsula, Java, Ceylon.

One of the most widely distributed species of the genus and closely allied to *U. ovalifolia*, Bl. I reduce to this species the *Uvaria cordata* of Wall. Cat., No. 6486; but not without some hesitation, as both Miquel and Kurz referred it to *U. ovalifolia*, Bl.

6. *UVARIA PURPUREA*, Blume Bijdr. 11: Fl. Jav. 13, t. 1 and t. 13 A. A sarmentose shrub, often climbing to 20 or 30 feet: young parts softly stellate-rufous-pubescent or tomentose. *Leaves* thickly membranous, oblong-lanceolate to elliptic-oblong, sometimes slightly obovate, acute or acuminate, the base rounded or slightly cordate, shortly petiolate; upper surface, when adult, shining, glabrous or glabrescent, the midrib and sometimes the nerves tomentose; under surface rather sparsely but softly stellate-tomentose; main nerves 14 to 17 pairs, rather straight, prominent beneath, the lower spreading, the upper sub-erect; length 4·5 to 9 or even 11 in., breadth 2·3 to 3·75 in.; petiole 1·5 to 2·5 in. *Peduncles* 1 to 1·5 in. long, extra-axillary or terminal, usually 1-sometimes 2-flowered; flowers 2 to 3 in. diam.; bracts 2, large, unequal, leafy; buds turbinate. *Sepals* broadly triangular, sub-concave, membranous, fulvous-tomentose on the outer, glabrescent on the inner surface. *Petals* longer than the sepals, coriaceous, oblong to obovate, obtuse, coriaceous, dark purple, the inner 3 slightly smaller. *Anthers* sub-sessile, very numerous, equal, about 3 in. long; the connective much produced at the apex, rhomboid in the inner, compressed and oblique in the outer anthers. *Ovaries* numerous, densely crowded, slightly shorter than the stamens, tomentose; ovules numerous. *Torus* depressed-hemispheric, pubescent, pitted when ripe. *Ripe carpels* numerous, stalked, oblong-cylindric, blunt at each end with 2, more or less obscure, ridges and grooves, minutely rufous-tomentose, sub-tuberculate, 1·5 to 2 in. long and about 5 in. in diam.; stalks 5 to 1 in. long, rufous-tomentose. *Seeds* numerous, flat. Hook. fil. and Thoms. Fl. Ind. 95; Miq. Fl. Ind. Bat. I, Pt. 2, 22; Ann. Mus. Lugd. Bat. II, 6; Hook. fil. Fl. Br. Ind. I, 47; Benth. Fl. Hong Kong, 9; Vidal y Soler, Revis. Fl. Filipinas, 39; Scheffer Obs. Phyt. I, 4, 26, 65; Ann. Jard. Bot. Buitenz. II, 1. *U. grandiflora*, Roxb. Fl. Ind. II, 665; Wall. Pl. As. Rar. II t. 121; Wall. Cat. 6485, A. to D. and H.; Wight and Arn. Prod. 9. *U. platypetala*, Champ. in Kew Journ. Bot. III, 257. *U. rhodantha*, Hance in Walp. Ann. II, 19. *Unona grandiflora*, DC. Prod. I, 90.

In all the provinces. Distrib: Malayan Archipelago, S. China, Phillipines.

Var. *tuberculata*; fruits prominently tuberculate.

Perak; King's Collector, Nos. 960, 4786.

A plant collected in the island of Bangka, closely resembling this in leaves, but with larger flowers with yellow petals, has been described by Messrs. Teysmann and Binnendyk under the name of *U. flava* (Nat. Tijds. Ned. Ind. XXIX, 419). It has also been figured by Miquel (Ann. Mus. Lugd. Bat. II, 6, t. 1). I fear it is merely a form of *U. purpurea*; but not having seen fruiting specimens, I hesitate to reduce it here.

7. *UVARIA HIRSUTA*, Jack Mal. Misc. (Hook. Bot. Misc. II, 87.) A sarmentose shrub but often climbing to the length of from 15 to 50 feet: young branches and petioles with numerous rather stiff reddish-brown hairs. *Leaves* thinly coriaceous, narrowly elliptic to elliptic-oblong, rarely obovate-oblong, acute or sub-acute, the base rounded or minutely cordate; upper surface with scattered sub-adpressed, stiff, mostly simple hairs, the midrib tomentose; lower surface with more numerous stellate and simple hairs: main nerves 9 to 14 pairs, spreading, depressed on the upper surface (when dry) but prominent on the lower; length 4 to 7 in., breadth 2.25 to 3.25 in., petiole .2 in. *Peduncles* 1 to 2 in. long, lateral or terminal, not axillary, 1- rarely 2-flowered; flowers 1.25 to 1.5 in. in diam.; bract solitary (rarely 2 or 3), lanceolate, deciduous: buds ovoid-globose, stiffly hairy. *Sepals* membranous, broadly ovate, acute, connate, pilose outside, reflexed. *Petals* red, larger than the sepals, broadly ovate, acute; outside tomentose with stiff hairs intermixed, inside sub-glabrous; anthers .15 in. long, sub-sessile, the connective at the apex often slightly produced and obtuse. *Ovaries* 4-angled, truncate, rufous-tomentose, shorter than the anthers. *Ripe carpels* numerous, stalked, cylindric, blunt, 1.5 to 2 in. long, covered (as are the stalks and torus) with dense darkly ferruginous tomentum mixed with stiff hairs: stalks 1 to 1.25 in. long: torus hemispheric: seeds numerous, ovoid, plano-convex. Blume Fl. Javae, Anon. 22, t. 5; Wall. Cat. 6153 (excl. C.); Hook. fil. and Thoms. Fl. Ind. 99; Hook. fil. Fl. Br. Ind. I, 48; Miq. Fl. Ind. Bat. I, Pt. 2, p. 24; Ann. Mus. Lugd. Bat. II, 8; Scheff. in Nat. Tijdsch. XXXI, 2; Zoll. in Linnæa XXIX, 304; Kurz Flora Burm. I, 28; Scheff. Observ. Phyt. I, 2. *U. trichomalla*, Bl. Fl. Jav. Anon. 42, t. 18. *U. velutina*, Blume (not of Roxb.) Bijdr. 13. *U. pilosa*, Roxb. Fl. Ind. II, 665.

In all the provinces. Distrib. Malayan Archipelago and Burmah.

There is some difference amongst individuals as to the breadth of the leaves, and on one of the forms with comparatively short but broad leaves Blume founded his species *U. trichomalla*.

8. *UVARIA CURTISII*, King n. sp. A large climber: young branches densely rusty-tomentose, slender. *Leaves* oblong-lanceolate, sometimes slightly oblanceolate, acuminate, slightly narrowed to the rounded base; upper surface glabrous except the strong rusty-tomentose midrib and the nerves; under surface stellate-rufous-tomentose, especially on the midrib, reticulations, and 7 to 12 pairs of ascending, curving, bold main nerves: length 4 to 9 in., breadth 1·7 to 3·25 in.; petiole ·15 to ·2 in., stout. *Flowers* 1 to 1·25 in. in diam., solitary or in pairs, axillary: pedicels 1 to 1·75 in., densely tomentose like the outer surface of the sepals, and with an ovate supra-median bracteole. *Sepals* broadly ovate, concave, spreading, puberulous within, ·35 in. long. *Petals* thinly leathery, white, subequal, ovate-oblong, obtuse; the outer rather broader than the inner, ·5 in. long, puberulous on both surfaces but especially on the outer. *Stamens* numerous, all perfect; connective truncate at the apex, not prolonged into a process; the anthers linear, lateral. *Ovaries* numerous, crowded, elongate, 3-angled, tomentose, with 12 ovules in 2 rows: stigma sessile, large, sub-capitate, corrugated, glabrous. *Ripe carpels* unknown.

Perak; on Ulu Bubong, King's Collector, No. 8543. Penang; elev. 2,000 feet. Curtis No 1415.

9. *UVARIA RIDLEYI*, King n. sp. A strong climber; young branches slender, stellate-rufous-tomentose, ultimately dark-coloured, striate; sparsely lenticellate. *Leaves* sub-coriaceous, elliptic-oblong, acuminate, slightly narrowed to the rounded base; both surfaces with short, stellate, rather pale hairs, scabrid on the upper, soft on the lower surface; the midrib and 10 to 15 pairs of spreading curving slightly prominent main nerves softly rufous-stellate-tomentose on both surfaces; length 3 to 5 in., breadth 1·3 to 2 in.; petiole ·15 in., stellate-tomentose. *Flowers* ·75 to 1·2 in. in diam., 2 or 3 together in short supra-axillary cymes; pedicels stellate-tomentose like the outer surface of the calyx, ·3 or ·4 in. long, with a large orbicular amplexicaul bracteole. *Sepals* orbicular, connate into an obscurely 3-toothed spreading cup ·4 in. in diam., glabrescent inside. *Petals* spreading, sub-orbicular to broadly oblong, very blunt, subequal, rather thin, minutely pubescent on both surfaces but especially on the outer, dark reddish-brown. *Stamens* numerous (the outer row converted into sub-quadrate staminodes) compressed, broad, without filaments; the apical process of the connective broad and flat: anther-cells on the edges of the connective, linear. *Ovaries* numerous, crowded, elongate, narrow, compressed, ridged, minutely stellate-tomentose, the ovules numerous; stigma sessile, short and broad, fleshy, obliquely truncate. *Ripe carpels* ovoid or obovoid, blunt at both ends, minutely pubescent, 1·2 to 1·5 in. long: stalks nearly 1 in., stellate-tomentose.

Seeds numerous in two rows, horizontal, oval, compressed, pale brown, shining.

Pahang: Ridley. Perak: Scortechini.

10. *UVARIA PAUCIOVULATA*, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 51. A sub-scandent shrub: young branches densely stellate rufous-tomentose. *Leaves* coriaceous, rigid, narrowly elliptic or elliptic-oblong, obtuse or obtusely acuminate, the base rounded or cordate; upper surface (in adult leaves) shining, quite glabrous; the lower dull, sparsely pubescent; main nerves 10 to 14 pairs, sub-ascending, curving, prominent beneath and impressed above: length of blade 2·5 to 6 in., breadth 1·25 to 3 in., petiole ·2 in. *Racemes* terminal, umbellate, few-flowered, 1·5 to 2·5 in. long, scurfily rufous-tomentose; bracts numerous and imbricate towards the apex, rotund to ovate, tomentose: buds ovoid-globose: flowers 1·5 in. in diam. *Sepals* small, (·3 in. long) orbicular, sub-acute, connate to the middle and densely tomentose outside, densely and minutely puberulous inside. *Petals* very much larger than the sepals, sub-connivent, coriaceous, ovate-rotund, obtuse, the inner 3 narrower; all scaly-tomentose externally, densely and minutely pubescent and veined internally; anthers sub-sessile, cuneate; connective slightly produced at the apex, truncate; ovaries longer than the stamens, flattened, stellate-hairy; stigma truncate, ovules 1 to 3. *Ripe carpels* numerous, stalked, sub-globose, mucronate, densely and minutely fulvous-tomentose, ·35 to ·5 in. in diam., 1- to 2-seeded; stalk ·5 to ·75 in., rather slender. *Seeds* compressed, shining.

Malacca; Maingay (Kew Distrib.), No. 104. Penang: Curtis, No. 825: at elevations of 500 to 600 feet.

11. *UVARIA SCORTECHINI*, King n. sp. A sarmentose, flexuose shrub; young branches and petioles densely covered with rusty, floccose, rufous tomentum. *Leaves* coriaceous, elliptic to elliptic-rotund, obtuse, very slightly or not at all narrowed to the rounded or minutely cordate base: upper surface shining, glabrescent or glabrous, the deeply impressed midrib and nerves tomentose, transverse veins depressed when dry; under surface minutely and softly rufous, pubescent especially on the midrib nerves and reticulations which are all bold and prominent: main nerves 10 to 12 pairs, spreading below, sub-ascending above, forming double arches within the edge: length of blade 4 to 7 in., breadth 2·5 to 4 in., petiole ·2 to ·4 in. *Flowers* 1·5 in. in diam., either terminal in umbels of 2 or 3, or in many-flowered lateral panicles 4 in. in length: peduncles ·5 to ·75 in. long; bracts numerous, but chiefly towards the apices of the peduncles, ovate-orbicular, covered with short rufous flocculent tomentum as are the branches and axes of the panicles. *Sepals* fleshy, triangular, sub-acute, connate in the lower third, concave,

spreading, minutely pubescent. *Petals* fleshy, about 1 in. long, connivent; the outer 3 ovate-rotund, very obtuse, tomentose-pubescent on both surfaces, the outer surface with some small superficial scales, the inner with a round glabrous spot at the base: inner 3 petals obovate, clawed, pubescent outside, glabrous inside except a broad pubescent band near the apex. *Anthers* sessile, angled, the connective projecting beyond the apex, broadly truncate, almost peltate. *Ovaries* (fide Scortechini) "several, with few stellate hairs, 2-3 ovuled: style cylindrical, curved, glabrous." *Fruit* unknown.

Perak: Scortechini, No. 1990.

Scortechini's are the only specimens I have seen, and they have flowers only.

12. *UVARIA MICRANTHA*, H. f. and Th Fl. Ind. 103. A large climber; young branches slender, softly rufous-tomentose, afterwards glabrous, striate, and dark-coloured with pale warts. *Leaves* thinly coriaceous, oblong-lanceolate, acuminate, the base rounded or slightly cuneate; both surfaces glabrous except the rufous-pubescent midrib: main nerves scarcely visible (even when dry), 12 to 15 pairs, spreading; length of blade 2·5 to 5·5 in., breadth ·8 to 1·4 in., petiole ·15 in. *Peduncles* terminal or extra-axillary, very short, 2-to 4-flowered, softly rufous-tomentose, bracts more or less orbicular; buds globose, slightly pointed, ·15 in. in diam.; flowers ·4 in. in diam. *Sepals* sub-rotund, densely pubescent outside, sub-glabrous inside. *Petals* broadly ovate, sub-obtuse, granular and minutely tomentose outside, pubescent inside. *Ripe carpels* numerous, stalked, ovoid-globose, rounded at each end, glabrous, 2- to 4-seeded. *Seeds* plano-convex, smooth; Hook. fil. Fl. Br. Ind. 1, 51; Kurz Fl. Burm. I, 22; Miq Fl. Ind. Bat. I, Pt. 2, 26; *Uvaria sumatrana*, Kurz Andam. Report, 29; Hook. fil. Fl. Br. Ind. I. 51. ? *Uvaria elegans*, Wall. Cat. 6474 B. *Gutteria micrantha*, A. DC. Mem. 42; Wall. Cat. 6449. *Polyalthia fruticans*, A. DC. 1 c. 42; Wall. Cat. 6430. *Anaxagorea sumatrana*, Miq. Fl. Ind. Bat. Suppl. 382.

Burmah, Malacca, Penang. Distrib. Sumatra.

As regards leaves, this closely resembles *Popowia nitida*, King—a plant of the Andaman and Nicobar Islands; and there is reason to believe that some specimens of that *Popowia* from those islands have been issued from the Calcutta Herbarium as *Uvaria micrantha*. I am also of opinion that *Uvaria sumatrana*, Kurz Andaman Report, 29, and of Hook. fil. and Thoms. Fl. B. Ind. I, 51, is possibly *Popowia nitida*, King.

13. *UVARIA ANDAMANICA*, King n. sp. Scandent: young branches rather stout, scurfily stellate-tomentose. *Leaves* oblong-ob lanceolate, shortly acuminate, much narrowed to the rounded, unequal, or minutely

cordate base; upper surface glabrous, the midrib and sometimes the nerves coarsely puberulous; under-surface reticulate, stellate-rufous-pubescent on the midrib and 18 to 22 pairs of spreading curving nerves; length 5·5 to 9 in., breadth 1·75 to 4 in.; petiole ·3 in., tubercular. *Flowers* small, in short terminal or axillary cymes, rarely solitary: pedicels ·3 in. long, densely covered like the outside of the sepals with sub-deciduous coarse, rusty, stellate tomentum; bracteole solitary, orbicular, ovate, close to the flower. *Sepals* valvate, orbicular, partly connate, glabrous inside. *Petals* imbricate, orbicular, fleshy, more or less puberulous outside, glabrous within; the inner rather smaller than the outer but both under (in the young state) ·25 in. in diam. *Stamens* numerous, narrowly elongate, the apex truncate more or less obliquely; anther-cells lateral. *Ovaries* absent in the stamiferous flower. *Ripe carpels* oblong, blunt (almost truncate) at each end, slightly tuberculate and densely covered with loose, sub-deciduous, rusty-stellate tomentum: pericarp rather thick. *Seeds* about 8 in 2 rows, plano-convex.

South Andaman; King's Collector.

This has been collected only on two occasions, once with undeveloped male flowers and once with immature fruit. The full size attained by the flowers is not known, and the measurements of sepals and petals above given are taken from buds. By its leaves and peculiar deciduous rusty stellate tomentum, the species is however readily recognisable.

14. *UVARIA EXCELSA*, Wall. Cat. 6477. A creeper 30 to 100 feet long: young parts stellate-pubescent; the branchlets tawny-tomentose, speedily becoming glabrous dark-coloured and furrowed. *Leaves* coriaceous, oblanceolate, obovate-oblong to elliptic, the apex acuminate (sometimes very shortly), acute, rarely obtuse, slightly narrowed to the minutely cordate base: upper surface shining, glabrous except the puberulous depressed midrib; lower surface minutely tawny-tomentose; main nerves 10 to 12 pairs spreading, slender; length 3·5 to 7·5 in., breadth 1·5 to 4 in.; petiole ·3 to ·5 in. pubescent. *Flowers* white, ·35 to ·4 in. in diam., in contracted cymes from the branches below the leaves, or axillary; pedicels only about ·2 in. long, rufous-tomentose with a large bract close to the flower. *Sepals* semi-orbicular, sub-acute, valvate, concave, spreading, tomentose outside, glabrous within. *Petals* in bud imbricate only at their apices, sub-equal, thick, concave, densely and minutely pubescent on both surfaces: the outer broadly ovate, acute, a little larger than the sepals: inner petals ovate, about as large as the sepals. *Anthers* numerous, narrow, the cells linear, lateral; the apical process of the connective thick, sub-quadrangle, obliquely truncate, minutely pubescent. *Ovaries* narrow, elongate, grooved, pubescent; the

stigma thick, sub-capitate, sub-truncate; ovules numerous, in two rows. *Ripe carpels* sub-globular, slightly obovoid, blunt at each end, densely and minutely tomentose, 1·1 in. long and ·9 in. in diam. *Seeds* about 14 in two rows, horizontal, half-oval, flat, smooth, brown. *Mitrephora excelsa*, H. f. and T. Fl. Ind. 114: Hook. fil. Fl. Br. Ind. I, 77; Miq. Fl. Ind. Bat. I, Pt. 2, 31.

Penang: Wallich, Curtis. Perak: King's Collector. Scortechini. Malacca: Maingay (Kew Distrib.), No. 36 *in part*.

This plant was originally issued as a *Uvaria* by Wallich. His specimens of it, however, bore no mature flowers; and Sir Joseph Hooker and Dr. Thomson referred them doubtfully to *Mitrephora*. The excellent specimens recently collected by Mr. Curtis and by the Calcutta Garden Collector show the petals to be sub-equal and concave, imbricate at the apex only, the sepals being quite valvate. This of course is not the typical flower of a *Uvaria*, in which the petals are *much* imbricate. But the stamens, ovaries and ripe fruit are more those of *Uvaria* than of any other genus.

15. *UVARIA ASTROSTICTA*, Miq. Fl. Ind. Bat. Suppl. 370. A climber? Young branches deciduously rufous-stellate-tomentose with simple hairs intermixed, ultimately glabrous striate and dark-coloured. *Leaves* coriaceous, oblong-lanceolate, sometimes slightly oblanceolate, acuminate, the base rounded or minutely cordate; upper surface minutely scaberulous, the midrib and sometimes the nerves softly rufous-pubescent; lower surface at first densely and softly tomentose, ultimately sparsely stellate-pubescent, sub-scaberulous; main nerves 12 to 16 pairs, spreading, rather prominent on the lower surface: length of blade 4 to 6 in., breadth 1·5 to 1·8 in., petiole ·2 in. *Peduncles* extra-axillary, very short (only ·3 in.), 2- to 3-flowered, rufous-stellate-tomentose as are the 2 or 3 sub-rotund bracts; buds sub-globular; flowers ·6 in. in diam. *Sepals* reniform, sub-acute, united half way. *Petals* nearly three times as long as the sepals, sub-coriaceous, broadly oval, slightly obovate, sub-acute, minutely pubescent. *Anthers* sub-sessile, the connective produced beyond the apices, flattened and truncate, 3 outer anthers barren: torus hispidulous. *Fruit* unknown; Miq. Ann. Mus. Lugd. Bat. II. 8.

Perak; Scortechini, No. 121. Distrib. E. Sumatra.

The Perak specimens of this plant agree perfectly with those from Sumatra on which the species was founded. It is allied to *U. heterocarpa* Bl., to *U. rufa* Bl., and also to *U. timoriensis*. I have never seen the fruit, and Miquel's entire description of it consists of the two words "carpella velutina."

Doubtful Species.

16. *UVARIA SUB-REPANDA*, Wall. Cat. 6483. A climber: young

branches very slender, rather sparsely scurfy-pubescent. *Leaves* membranous, oblong or obovate-oblong, acute, the base rounded: upper surface shining, glabrous except the pubescent midrib; under-surface pale, yellowish-brown when dry, dull, at first puberulous, ultimately quite glabrous including the midrib, the reticulations distinct; main nerves 10 to 14 pairs, spreading, thin but rather prominent beneath: length of blade 5 to 7·5 in., breadth 2 to 2·25 in.; petiole ·15 to ·25 in., densely scaly-pubescent. *Peduncles* axillary, rufous-stellate-tomentose, 1-flowered; bracts cucullate, sub-orbicular. *Petals* narrowly oblong. *Ripe carpels* unknown. Hook. fil. and Thoms. Fl. Ind. 101: Hook. fil. Fl. Br. Ind. I. 50.

Singapore, Wallich.

A very imperfectly known species, the only specimens being Wallich's which are not good and which are in flower only. The only other specimen which agrees with Wallich's specimens as to leaves and branches is from Penang (Curtis No. 1408): but this has a short 2-flowered, extra-axillary peduncle, and I hesitate to identify it with *U. sub-repanda*.

5. ELLIPEIA, H. f. and T.

Characters of *Uvaria*, but with solitary, ventral or sub-basal ovule and 1-seeded carpels, the style sometimes elongate.

Distrib. Malaya: species 10 or 11.

Flowers all hermaphrodite.

Flowers in groups.

- | | | |
|---|--------|---------------------------|
| Leaves oblong or narrowly obovate-oblong, acuminate, pubescent, puberulous or glaberrulous beneath: flowers in short panicles | ... .. | 1. <i>E. cuneifolia</i> . |
| Leaves obovate-oblong, obtuse, softly tomentose beneath, peduncles 3- or 4-flowered | | 2. <i>E. leptopoda</i> . |
| Leaves oblong or elliptic-oblong, acute, glabrous, cymes 3-to 5-flowered | ... .. | 3. <i>E. glabra</i> . |

Flowers solitary.

- | | | |
|---|--------|------------------------|
| Leaves oblong-lanceolate to ovate-lanceolate, acuminate, minutely granular above when dry | | 4. <i>E. costata</i> . |
|---|--------|------------------------|

Flowers unisexual or polygamous, solitary or in pairs.

- | | | |
|--|--------|-----------------------|
| Leaves shortly acuminate, both surfaces minutely granular when dry, not reticulate: stalks of carpels ·15 in. long | | 5. <i>E. pumila</i> . |
|--|--------|-----------------------|

Leaves acute, rarely acuminate, not granular,
 reticulations transverse and very distinct;
 stalks of carpels $\cdot 75$ to 1 in. long ... 6. *E. nervosa*.

1. *ELLIPEIA CUNEIFOLIA*, H. f. and T. Fl. Ind. 104. A climber 80 to 100 feet long: young branches at first shortly and densely rufous-tomentose, ultimately sub-glabrous. *Leaves* thinly coriaceous, oblong or narrowly obovate-oblong, the apex broadly abruptly and shortly acuminate, the base rounded or sub-cordate: upper surface glabrous, shining, the midrib and often the main nerves tomentose; lower minutely rufous-tomentose to pubescent, very often glaberulous: main nerves 16 to 19 pairs, spreading to sub-ascending, prominent beneath: length of blade 4 to 7 in., breadth 1.5 to 3 in.; petiole $\cdot 15$ to $\cdot 2$ in., tomentose. *Flowers* $\cdot 75$ to 1 in. in diam., in short few-flowered pedunculate rufous-tomentose panicles; bracts at the bases of the pedicels ovate, that at the base of the flower rotund: pedicels $\cdot 25$ to $\cdot 4$ in. long: buds ovoid-conic. *Sepals* small, fleshy; sub-orbicular, slightly united below, spreading, coriaceous, tomentose. *Petals* fleshy, connivent; outer 3 much larger than the sepals, rotund, densely pubescent on both surfaces; inner 3 not much larger than the sepals, rotund, pubescent externally, glabrous internally. *Anthers* sessile, short, the cells on the outer surface; the apex with a broad, round, oblique, truncate appendage from the connective; pistils oblong, tapering to each end, pubescent. *Torus* small, sub-globose. *Ripe carpels* numerous, on long stalks, ovoid, oblique, blunt, with a faint partial ridge and a short lateral, conical process, minutely yellowish-tomentose. *Seed* smooth, ovoid. Hook. Ic. Plant. t. 1025; Hook. fil. Fl. Br. Ind. I, 52.

Malacca: Griffith, Maingay (Kew Distrib.) No. 31. Perak, very common.

In the Perak specimens the tomentum on the under-surface of the leaves is usually less dense than in specimens from Malacca: moreover the flowers are smaller in the Perak specimens, and the floral bract is not close to the calyx but a little way under it. In other respects, however, they agree.

2. *ELLIPEIA LEPTOPODA*, King, n. sp. A climber, 50 to 70 feet long: young branches and petioles densely covered with scurfy cinereous tomentum. *Leaves* coriaceous, obovate-oblong, rarely elliptic, obtuse, or with a very short blunt apiculus, narrowed in the lower half to the minutely cordate, rarely entire, base: upper surface pale-green when dry, sparsely and minutely stellate-pubescent when young, afterwards glabrous except the pubescent midrib: lower surface densely covered with soft, short, dense, pale brown tomentum; main nerves 10 to 12 pairs, spreading, obsolete on the upper, slightly prominent on the lower, surface: length of blade 3.5 to 5 in., breadth 2.25 to 2.5 in., petiole $\cdot 2$ to

·25 in. *Peduncles* extra-axillary, about ·5 in. long; the flowers 3 or 4 on short pedicels, each subtended by a rotund-obovate, cucullate bract; the whole inflorescence and calyx rather sparsely stellate-tomentose: buds depressed-globose: flower ·75 in. in diam. *Sepals* often 4 in number, semi-orbicular, very obtuse, slightly united below, spreading. *Petals* coriaceous, three times as long as the sepals, ovate-rotund, obtuse, recurved, minutely pubescent on both surfaces, dark crimson. *Anthers* sessile, very small, the connective produced beyond the apex, flattened, oblique. *Ovaries* about as long as the anthers; the stigmas truncate, hairy. *Torus* hemispheric. *Carpels* numerous, on long slender stalks, ovate-rotund, ·5 in. long, slightly oblique with a slight lateral beak, minutely cinereous-pubescent. *Stalks* slightly thickened and ridged towards the apex, 1·5 to 2·5 in. long. *Seed* ovoid, flattened on one side, smooth.

Perak; at low elevations, King's Collector. Singapore, Ridley.

A species in its leaves resembling *Uvaria heterocarpa*, Bl. but with different fruit: also like *U. timorensis*, Miq., but with much more obovate leaves.

3. *ELLIPEIA GLABRA*, H. f. and T. Fl. Br. Ind. I, 52. A tree: young branches and inflorescence brown-pubescent. *Leaves* coriaceous, oblong or elliptic-oblong; the base rounded or acute; both surfaces glabrous, not shining, the upper rigid, the lower paler and reticulate: main nerves about 9 pairs, curved, sub-ascending, prominent beneath; length 4 to 5·5 in., breadth 1·5 to 2 in., petiole ·25 in. *Cymes* shortly pedunculate, axillary, 3- to 5-flowered, 1 to 1·5 in. long. *Flowers* 1·5 in. in diam.; bracteole oblong, sub-amplexicaul, recurved. *Sepals* ovate-lanceolate, acute, recurved, ·25 in. long. *Outer petals* obovate-lanceolate, sub-acute, flat, without claws, 1 in. long; the inner shorter, obovate, obtuse. *Ovaries* glabrous below, strigose above; ovule 1, erect (Maingay). *Ripe carpels* sub-globose, ·65 in. long; pedicels slender, ·75 to 1·25 in. long; pericarp thin. *Seed* oblong, pale, with a deep longitudinal furrow.

Malacca; Maingay No. 66 (Kew Distribution).

Except Maingay's I have seen no specimens of this.

4. *ELLIPEIA COSTATA*, King. A shrub about 10 feet high: young branches pale, rusty-tomentose. *Leaves* coriaceous, oblong-lanceolate to ovate-lanceolate, acuminate, the base cuneate: upper surface glabrous but rather rough; lower pale, softly and laxly pubescent, sub-glabrescent when old; main nerves 8 to 9 pairs, bold, sub-ascending, rather straight: length 4 to 6·5 in., breadth 2 to 2·5 in.; petiole ·25 in., tomentose. *Flowers* solitary, extra-axillary, ·75 to 1 in. in diam.: pedicels woody, tomentose, ·15 in. long, with 3 ovate acute bracts at their bases. *Sepals* ovate, obtuse, half as long as the petals and, like them, sericeous exter-

nally and glabrous or sub-glabrous internally. *Petals* subequal, oblong, obtuse, .35 to .45 in. long. *Ripe carpels* ovoid-cylindric, slightly apiculate and shortly stalked, glabrous, .8 in. long and .35 in. in diam.; pericarp thin.

Burmah; on Moolyet at 5,000 ft. Gallyatly.

I have seen no entire fruit of this species but only some loose carpels. When ripe they are said by Mr. Gallyatly to be red.

ELLIPEIA PUMILA, King, n. sp. A shrub 2 to 8 feet high: young branches with minute pale rufous tomentum; when older dark-coloured, glabrous and furrowed. *Leaves* coriaceous, oblong-lanceolate to elliptic-lanceolate, tapering from the middle to the shortly acuminate apex and acute base; both surfaces minutely granular when dry, the upper glabrous; the lower sparsely adpressed-pubescent; the midrib rufous-pubescent; main nerves about 9 pairs, oblique, rather straight, faint on the lower surface, obsolete on the upper; length 4.5 to 7 in., breadth 1.5 to 2.25 in.; petiole .25 to .35 in., pubescent. *Flowers* solitary, or in pairs, extra-axillary, sub-sessile, .75 in. in diam. when expanded, the buds globose; pedicels .1 in. long, coarsely hirsute, bracteate. *Sepals* much shorter than the petals, broadly ovate, sub-acute, strigose-pubescent outside and sub-glabrous inside as are the petals. *Petals* imbricate, spreading, lanceolate or oblanceolate-oblong, the outer at first much shorter than, but ultimately sub-equal to, the inner. *Male-flower*: stamens numerous, with transversely elongate, truncate, heads; pistils 0. *Female flower* like the male but with fewer stamens; pistils about 10, pubescent, 1-ovuled; stigma short, flat, pubescent. *Carpels* 4 to 5, sub-cylindric, tapering to each end, .75 in. long and .25 in. diam., minutely granular and strigose; stalks tomentose, .15 in. long; torus very small. *Seed* solitary, oblong, pale.

In leaves and in general facies this is very like *Popowia nervifolia*, Maing., but its petals are distinctly imbricate.

Perak on Ulu Bubong; King's Collector, Scortechini.

6. ELLIPEIA NERVOSA, Hook. fil. and Thoms. Fl. Br. Ind. I, 52. A tree 40 feet high; young branches glabrous, dark-coloured, slightly ridged. *Leaves* coriaceous with pellucid dots, elliptic-oblong, or lanceolate-oblong, acute or rarely shortly acuminate, the base acute; upper surface glabrous; the lower sparsely strigose, the reticulations transverse and very distinct; main nerves 10 or 11 pairs, oblique, rather straight; length 8 to 11 in., breadth 2 to 3.5; petiole .35 to .5 in. glabrous. *Flowers* polygamous, solitary, extra-axillary, rarely in pairs, .75 in. in diam., globose; pedicels stout, .1 to .2 in. long, rufous-pilose, bracteate. *Sepals* broadly ovate, acute, pubescent, much smaller than the petals. *Petals* white, spreading, imbricate; the outer broadly ovate-oblong, ob-

tuse; the inner rather shorter and narrower, oblong; all pubescent especially externally. *Stamens* in the male flowers numerous, with roundish flat heads. *Ovaries* in the female flower many, curved. *Carpels* rather numerous, ovoid, slightly apiculate, narrowed into the stalk, rose-red when ripe (Wray), about 1 in. long and .5 in. in diam., glabrous; their stalks .75 to 1 in. long.

Malacca; Maingay, (Kew Distrib.), No. 47. Perak; common at low elevations. Penang; Curtis.

In the texture and nervation of its leaves this species has a strong resemblance to *Popowia nervifolia*, Maing. and other species in its neighbourhood. But the petals are not those of a *Popowia*, both rows being distinctly imbricate. The fruit moreover is larger than that of *Popowia*, and the albumen is much more cellular in structure being, in this respect, like that of *Ellipeia cuneifolia*, H. f. & Th.

6. CYATHOCALYX, Champion.

Trees. *Leaves* glabrous. *Flowers* fascicled, terminal or leaf-opposed. *Sepals* free or united into a 3-lobed cup. *Petals* 6, 2-seriate, valvate in bud, subequal, bases concave conniving, blade flat spreading. *Stamens* indefinite, long-cuneate, truncate; anther-cells linear, dorsal. *Ovaries* solitary or 2-6, on a concave torus; stigma large, grooved; ovules many. *Ripe carpels* berried.—DISTRIB. Tropical India and Malaya; species 8.

Ripe carpels ovoid 1 *C. virgatus*.

Ripe carpels globular 2 *C. Maingayi*.

In its petals this genus resembles *Artabotrys* to some extent, but *Polyalthia* still more. The ovaries in the first two species are usually solitary; in the third they are 3 in number: the ripe carpels of all three being large succulent and many-seeded. Baillon admits the genus as it was established by Champion and accepted by Hooker filius & Thomson. In the above diagnosis I have however modified the definition so as to provide for the species with more than one ovary.

1. CYATHOCALYX VIRGATUS, King. A tree 40 to 60 feet high: young branches slender, pale, glabrous, the tips alone pubescent. *Leaves* membranous, elliptic-oblong to oblong-lanceolate, shortly and obtusely acuminate, the base cuneate or sometimes rounded; both surfaces shining, the lower rather darker when dry; the upper glabrous, the lower pubescent on the 8 or 9 pairs of sub-ascending rather prominent nerves: length 4 to 6.5 in., breadth 1.25 to 2.75 in.; petiole .25 to .35 in., pubescent. *Flowers* in axillary, sub-sessile fascicles of 2 or 3, about .75 in. long. *Sepals* united at the base, ovate to ovate-lanceolate, spreading, tomentose, shorter than the inner petals. *Petals* tomentose-sericeous; the outer row much longer than the inner, lanceolate, much acuminate,

about, .75 in. long.; inner row with orbicular concave base and much acuminate apex, .5 in. long. Connective of *stamens* slightly produced at apex and obliquely truncate. *Ovaries* 4 to 6, hirsute; ovules many, 2-seriate; stigma thick, discoid, sessile; torus conic, truncate, pubescent. *Ripe carpels* solitary, or in pairs and divergent, oblong-ovoid, blunt at each end, minutely tomentose, 2 to 3 in. long, and 1 to 1.5 in. in diam.; pericarp thick; seeds 8 to 10, compressed, elongate and narrowly sub-reniform, transversely substriate. *Unona virgata*, Blume Bijdr. 14; Fl. Javæ Anon. 43 t. 19 and 25B.; Miq. Fl. Ind. Bat., I. Pt. 2, p. 42. *Meiogyne virgata*, Miq. Ann. Mus. Lugd. Bat. II., 12. *Cananga virgata*, Hook fil. and Thoms. Fl. Br. Ind. I, 57.

Malacca: Maingay (Kew Distrib.), No. 92. Perak; King's collection. Distrib. Java.

Blume describes the carpels as from 3 to 5; but I have never found more than two, and it is difficult to understand how more can come to perfection on the comparatively small torus. In Java this is said often to be a bush from 6 to 8 feet high: in Perak it is a tall tree.

2. CYATHOCALYX MAINGAYI, Hook. fil. and Thoms. Fl. Br. Ind. I, 53. A tree 50 or 60 feet high: young branches rather stout, puberulous, speedily glabrous and dark-coloured. *Leaves* elliptic to oblong, thinly coriaceous, slightly obovate, shortly caudate-acuminate, the base rounded or slightly cuneate; upper surface shining, quite glabrous; the lower puberulous when young, ultimately glabrous; the main nerves 13 to 15 pairs, bold and prominent, spreading, interarching near the edge: length 5.8 to 8.8 in., breadth 2.75 to 3.75 in., petiole .3 in. *Flowers* 2 to 3 in. in diam., solitary or in short, 2- to 3-flowered racemes, axillary or extra-axillary: pedicels .5 to .75 in. long with a large stem-clasping bracteole near the apex. *Sepals* spreading or sub-reflexed, ovate, sub-acute, slightly connate at the base, puberulous on both surfaces, .4 in. long. *Petals* thinly coriaceous, subequal, puberulous, obovate or broadly obovate-lanceolate, blunt, the base with a short claw, pale greenish with a blotch of reddish yellow at the base, all (but especially the inner row) more or less convex, the inner row slightly concave and glabrous at the base inside. *Stamens* numerous, cuneate, short; the connective produced into a broad, flat, orbicular, oblique expansion which overhangs the dorsal linear anthers. *Ovaries* 3, narrowly ovoid, pubescent, ovules about 10 in 2 rows: style short, lateral: stigma large, lobed, villous. *Ripe carpels* 1 or 2, globular, 1.5 to 1.75 in. in diam., slightly tubercular when dry and minutely pubescent. *Seeds* 10 in 2 rows, elongated, compressed.

Malacca: Maingay (Kew Distrib.), No. 94. Singapore: Ridley. Perak: King's Collector.

This species is doubtfully referred to *Cyathocalyx* by its authors, and chiefly on the ground that the petals, although valvate at the base, are slightly imbricate above. An examination of the large number of specimens sent from Perak by the Calcutta Botanic Garden Collector enables me to state that in bud the petals are truly valvate, but that as they develop they undoubtedly overlap. The anthers, ovaries and ripe fruit appear to me to be those of *Cyathocalyx*; and in habit and general appearance of its leaves this plant agrees with the other species above described. In addition to the species above described, there are, in the Calcutta Herbarium, fruiting specimens from Perak of a small tree which is apparently a fourth species of *Cyathocalyx*. The leaves of this are oblong-lanceolate to oblong-ovate, 8- to 10-nerved, glabrous above and puberulous beneath; and the ripe carpels are in pairs, ovoid, puberulous, about 1.5 in. long. None of the specimens has any trace of flower.

7. ARTABOTRYS, R. BROWN.

Sarmentose or scandent shrubs. *Leaves* shining. *Flowers* solitary or fasciated, generally on woody, usually hooked, recurved branches (peduncles). *Sepals* 3, valvate. *Petals* 6, 2-seriate, bases concave connivent; limb spreading, flat, sub-terete or clavate. *Stamens* oblong or cuneate; connective truncate or produced; anther-cells dorsal. *Torus* flat or convex. *Ovaries* few or many; style oblong or columnar; ovules 2, erect, collateral. *Ripe carpels* berried.—*DISTRIB.* Tropical Africa and Eastern Asia; described species about 32.

This genus is at once distinguished by the curious hooked flower-peduncles. The petals are thick and mostly narrow, concave and closely connivent at the base, while the limb is spreading. The habit of all is scandent. Besides those described below, there are in the Calcutta Herbarium imperfect materials of five undescribed species from Perak, and of one from the Andaman Islands.

Petals lanceolate to elliptic.

Flowers less than 1 in. long.

Petals very fleshy, broadly elliptic, blunt 1. *A. grandifolius*.

„ coriaceous, broadly lanceolate, acuminate 2. *A. Scortechinii*.

„ slightly fleshy, elliptic-oblong, obtuse 3. *A. pleurocarpus*

Flowers about 1 in. long.

Outer petals ovate-lanceolate; the inner lanceolate or linear 4. *A. venustus*.

Flowers more than 1 in. long.

- Leaves elliptic to oblong, obtuse or shortly
and bluntly mucronate, coriaceous ... 5. *A. crassifolius*.
- Leaves oblong, acuminate, coriaceous ... 6. *A. oblongus*.
- Leaves oblong-lanceolate.
- Leaves shortly caudate-acuminate,
flower nearly 2 in. long ... 7. *A. Lowianus*.
- Leaves shortly acuminate; flower 1·5
to 1·75 in. long; ripe carpels nar-
rowly elliptic, tapering to both ends,
glabrous 8. *A. ozycarpus*.
- Limb of petals linear, sub-triquetrous, cylindric, or
sub-clavate.
- Petals thickly coriaceous, linear, blunt, ad-
pressed-pubescent 9. *A. speciosus*.
- Petals linear-oblong, obtuse, (glabrous?) 10. *A. Maingayi*.
- Petals fleshy, the outer 3 flattened; the
inner 3 obtusely triquetrous ... 11. *A. gracilis*.
- Petals fleshy, the limb cylindric to clavate 12. *A. suaveolens*.
- Imperfectly known species 13. *A. costatus*.
- * * * 14. *A. Wrayi*.

1. *ARTABOTRYS GRANDIFOLIUS*, n. sp. King. A powerful creeper 60 to 80 feet long; young branches stout, pale, striate, glabrous. *Leaves* thinly coriaceous, large, minutely pellucid-punctate, pale yellowish-green when dry, elliptic-oblong to elliptic-obovate; the apex broad, obtuse or abruptly sub-acute; the base cuneate: both surfaces glabrous, distinctly reticulate, the upper shining, the lower duller: main nerves 10 to 12 pairs, oblique, inter-arching boldly .25 in. from the edge; length of blade 8 to 14 in., breadth 3 to 5 in.: petiole .4 in., stout. *Petals* very fleshy, densely and minutely tomentose, unequal; the outer 3 broadly elliptic, sub-acute or blunt, slightly concave, .75 in. long and .4 in. broad: inner 3 obovoid, spreading but with incurved apices, slightly shorter than the outer. *Peduncles* (in fruit) nearly 3 in. long, stout: torus hemispheric, 1 in. in diam. *Ripe carpels* numerous, glabrous, lenticellate, elliptic-obovoid, the apex mammillate, narrowed at the base into a short stout pseudo-stalk nearly .5 in. long; length of ripe carpel about 1·5 in., diam. 1 in.: pericarp hard, about .1 in. thick. *Seed* solitary, narrowly ellipsoid, blunt, 1·1 in. long, and 6 in. in diam.; the testa pale, rugulose. *A. macrophyllus*, King MSS. (not of Hook. fil).

Perak; at Goping, elevation 500 to 800 feet, King's Collector, No. 4477; Scortechini No. 1068.

Some specimens of this were unfortunately distributed from the Calcutta Herbarium under the MSS. name of *A. macrophyllus*,—a name

pre-occupied by an African species described by Sir J. D. Hooker (*Niger Flora*, 207).

2. *ARTABOTRYS SCORTECHINII*, n. sp. King. A climber. All parts except the flower and possibly the fruit glabrous: young branches slender, dark-coloured. *Leaves* thinly coriaceous, ovate-lanceolate, shortly acuminate, the base cuneate; upper surface shining; the lower dull when young, very minutely scaly, afterwards glabrous; main nerves 9 to 11 pairs, spreading, inter-arching $\cdot 1$ in. from the edge, slender but rather prominent beneath: length of blade 2·25 to 3·25 in., breadth $\cdot 9$ to 1·3 in., petiole 2 in. *Peduncle* rather slender, 3- to 4-flowered; pedicels $\cdot 5$ in. long, thickened upwards, puberulous, with a small ovate bracteole at the very base. *Flowers* $\cdot 6$ to $\cdot 8$ in. long. *Sepals* very coriaceous, triangular, acuminate, the apices slightly reflexed, conjoined at the base only, rugulose and adpressed-pubescent externally, $\cdot 25$ in. long. *Petals* coriaceous, broadly-lanceolate acuminate, tomentose on both surfaces, the inner three smaller than the outer 3. *Anthers* with broad connective apical appendages. *Torus* rather flat, sericeous: ovaries glabrous. *Fruit* unknown.

Perak, Scortechini.

A species near *A. polygynus*, Miq., but with glabrous leaves and different flowers from that species.

3. *ARTABOTRYS PLEUROCARPUS*, Maingay in Hook. fil. *Fl. Br. Ind.* I, 54. A large climber; all parts except the flowers glabrous; young branches lenticellate, striate, dark-coloured. *Leaves* coriaceous, oblanceolate-oblong, the apex abruptly and shortly acuminate, the base much narrowed: both surfaces shining and reticulate, the upper paler; main nerves about 10 pairs, spreading, slender: length of blade 4 to 6·5 in., breadth 1·5 to 2·25 in.; petiole $\cdot 15$ in., thick. *Peduncles* flat, stout, much hooked, bearing several ebracteolate pedicels, $\cdot 5$ in. long, densely pubescent. *Flowers* 1·5 in. long. *Sepals* broadly ovate, obtuse. *Petals* subequal, flat, elliptic-oblong, obtuse, pubescent on both surfaces, the outer 1 to 1·35 in. long, the inner smaller. *Anthers* with apiculate connectives. *Ovaries* many, slender. *Ripe carpels* broadly elliptic, mammillate, obscurely grooved, narrowed into the short stout stalk, $\cdot 75$ in. long. *Seeds* 2, with hard testa.

Malacca; Maingay. Perak, Scortechini, No. 331.

4. *ARTABOTRYS VENUSTUS*, n. sp., King. A large climber, 30 to 80 feet long; young branches at first puberulous, afterwards glabrous, dark coloured, striate. *Leaves* coriaceous, elliptic to elliptic-oblong, abruptly and shortly acuminate, the base rounded or very slightly narrowed: both surfaces glabrous, the upper shining, the lower dull, adult leaves pale brown (when dry): main nerves 7 to 10 pairs, spreading

or sub-ascending, curved, inter-arching freely $\cdot 1$ to $\cdot 2$ in. from the edge, prominent on the lower, less so on the upper, surface; length of blade $3\cdot 5$ to 6 in., breadth 2 to 3 in., petiole $\cdot 2$ to $\cdot 25$ in. *Peduncles* extra-axillary, rather slender in flower, (stout in fruit), minutely tomentose, bearing 3 or 4 flowers, $\cdot 75$ to 1 in. long.; pedicels slender, pubescent or glabrescent., from $\cdot 5$ to 1 in. long, ebracteate. *Sepals* coriaceous, broadly triangular, sub-acute, slightly conjoined at the base, sub-reflexed, puberulous externally, glabrous within, $\cdot 15$ in. long. *Petals* coriaceous, minutely tomentose, subequal; the outer 3 with small claw, glabrous inside, ovate-lanceolate sub-acute; the inner 3 shorter than the outer, lanceolate or linear. *Anthems* short, slightly compressed; the apex orbicular, flat. *Ovaries* about 10, oblong, granular. *Carpels* about 6, sessile, narrowly obovoid, apiculate, slightly narrowed to the base, at first puberulous, ultimately glabrous, $1\cdot 5$ in. long and $\cdot 8$ in. in diam.; pericarp thin. *Seeds* 2, oblong, plano-convex, about 1 in. long and $\cdot 6$ in. broad, smooth.

Perak; at elevations up to 1,000 feet, King's Collector, Nos. 3725, 4392, 6499, 6963, King's Collector.

5. *ARTABOTRYS CRASSIFOLIUS*, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 54. A large climber; young branches minutely rusty-tomentose. *Leaves* very coriaceous when adult, elliptic to oblong, obtuse or shortly and bluntly mucronate, the base acute or rounded: upper surface glabrous, shining; the lower dull, paler in colour when young, sparsely adpressed-pilose, afterwards glabrous; main nerves 9 or 10 pairs, oblique, when dry faintly impressed on the upper and slightly prominent on the lower surface; length of blade 6 to $6\cdot 5$ in., breadth $1\cdot 75$ to $2\cdot 75$ in.; petiole $\cdot 3$ to $\cdot 4$ in., stout. *Peduncles* flat, much hooked, stout: each with several stout rusty-tomentose pedicels $\cdot 3$ to $\cdot 4$ in. long; bracts few, ovate. *Flowers* $1\cdot 25$ in. long. *Sepals* ovate-lanceolate, sub-obtuse, softly rusty-pubescent outside, pubescent within. *Petals* coriaceous, oblong-lanceolate, sub-ovate, densely tomentose on both surfaces; the inner 3 smaller than the outer 3. *Fruiting pedicel* very stout; the torus sub-globose. *Ripe carpels* about 8, sessile, sub-obovoid to ovoid, glabrous, slightly rugose, $1\cdot 25$ to $1\cdot 65$ in. long and $\cdot 75$ to $1\cdot 15$ in. in diam.; pericarp thick, pulpy. *Seeds* 2, collateral, oblong, compressed, grooved along the edge, $\cdot 9$ in. long and $\cdot 6$ in. broad. Kurz For. Flora Burma, I, 30.

Burmah; Martaban, King, Brandis. Perak; King's Collector, No. 8384.

6. *ARTABOTRYS OBLONGUS*, n. sp., King. A climber 50 to 70 feet long, ultimately all parts except the inflorescence glabrous; young branches slender, rufous-pubescent; the bark dark-coloured when very young, afterwards rather pale, striate. *Leaves* when adult coriaceous, oblong, shortly acuminate, the base acute, when adult both surfaces

glabrous, the upper shining, the lower dull and when young sparsely pubescent along the midrib; main nerves 10 to 12 pairs, inconspicuous on the upper, slightly prominent in the lower surface, spreading, forming 2 or 3 series of arches within the margin; length of blade 6·5 to 9 in., breadth 2·5 to 3 in., petiole ·4 in. *Peduncles* stout, pubescent when young, bearing 3 or 4 pedicels; flowers 1·35 in. long; pedicels about 1 in., pubescent, slightly thickened upwards. *Sepals* coriaceous, triangular, acute, concave, spreading rufous-pilose on both surfaces, slightly conjoined at the base, ·25 in. long. *Petals* coriaceous, the portion above the saccate base lanceolate, subacute, strigosely tomentose on both surfaces, the claw partly glabrous and partly covered with minute white hair. *Anthers* compressed, with oblong, obliquely truncate, flattened heads. *Ovaries* few, oblong, glabrous; the stigma broad, oblique. *Fruit* unknown.

Perak; King's Collector, No. 6524.

7. *ARTABOTRYS LOWIANUS*, n. sp., Scortechini MSS. A stout climber; all parts except the flowers glabrous; young branches slender, dark-coloured. *Leaves* thinly coriaceous, oblong-lanceolate, shortly caudate-acuminate, the base cuncate: both surfaces shining, minutely reticulate; main nerves 8 to 10 pairs, spreading, inter-arching ·2 in. from the margin, faint; length of blade 3·5 to 6 in., breadth 1·25 to 1·75 in., petiole ·25 in. *Peduncles* extra-axillary, 2- to 3-flowered, glabrous; pedicels thickened upwards, ·5 to 75 in. long, glabrous. *Sepals* triangular, acute, glabrous, ·25 in. long, enlarging a little with the fruit. *Petals* fleshy, adpressed-puberulous, elliptic-lanceolate above the concave base, obtuse; the outer three 1·75 in. long, the inner three smaller. *Anthers* with a rounded apical process from the connective. *Ovaries* many, glabrous. *Carpels* (quite young) sessile, ovoid, apiculate; ripe carpels unknown.

Perak; Scortechini; No. 2012.

This species is near *A. pleurogynus*, Miq, but is perfectly glabrous, not sub-strigose pubescent; its ripe fruit is unknown.

8. *ARTABOTRYS OXYCARPUS*, n. sp., King. A stout climber, 60 to 80 feet long; all parts except the flower glabrous; young branches slender, black when dry. *Leaves* oblong-lanceolate, shortly acuminate, the base cuncate, both surfaces shining, reticulate; main nerves 6 to 8 pairs, spreading, slender; length of blade 3 to 5·5 in., breadth 1·25 to 1·5 in. *Peduncles* short (·75 in. long), glabrous, bearing about 2 minutely bracteolate pedicels ·75 in. long. *Flowers* 1·5 to 1·75 in. long. *Sepals* coriaceous, small, broadly ovate, acute, ·2 in. long, conjoined at the base, spreading. *Petals* coriaceous, very much longer than the sepals, lanceolate, obtuse; the inner 3 smaller; all adpressed-pubescent, and the

saccate base small in all. *Torus* small, scriceous. *Ovaries* glabrous. *Ripe carpels* numerous, sessile, glabrous, narrowly elliptic, tapering to each end, the apex caudate, 1 to 1·2 in. long and ·4 in. in diam.; pericarp thin. *Seeds* 2, plano-convex, compressed, blunt, ·25 in. long.

Perak; King's Collector, Nos. 5150 and 5605; Wray No. 3286.

This species comes near the Bornean *A. polygynus*, Miq. (Ann. Mus. Lugd. Bat. II, 4). But this species has more pointed and perfectly smooth ripe carpels; while those of *A. polygynus* are more ovoid, with shorter terminal point and have many vertical ridges. *A. polygynus* moreover is sub-strigose pubescent, this is glabrous.

9. *ARTABOTRYS SPECIOSUS*, Kurz in Hook. fil. Fl. Br. Ind. I, 55. A large climber: young branches slender, dark-coloured, sparsely adpressed-pilose, afterwards glabrous. *Leaves* coriaceous, oblong or oblong-lanceolate, rarely oblanceolate, shortly and obtusely acuminate, the base acute; both surfaces glabrous, shining: main nerves 7 to 10 pairs, spreading, inter-arching at some distance from the edge, slender: length of blade 6 to 8 in., breadth 2 to 2·5 in., petiole ·25 in. *Peduncles* extra-axillary, flattened, short and not much hooked, puberulous, each bearing several short puberulous 1-flowered ebracteolate flower-pedicels: flowers from 1·25 to nearly 2 in. long, yellow. *Sepals* ·2 in. long, broadly ovate, acute, pubescent outside, glabrous inside. *Petals* thickly coriaceous, adpressed-pubescent, linear above the concave base, rather blunt; the inner smaller than the outer; torus pilose: fruit unknown. Kurz For. Flora, Burm. I, 32.

Andaman Islands; along Middle Straits, Kurz. S. Andaman; at Caddellunge, King's Collector.

10. *ARTABOTRYS MAINGAYI*, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 55. A powerful creeper, 40 to 80 feet long: all parts glabrous except the flowers; the young branches slender, dark-coloured. *Leaves* thin, elliptic, acuminate at base and apex: both surfaces shining, finely reticulate: main nerves 7 to 9 pairs, spreading, faint: length of blade 3·5 to 6 in., breadth 1·35 to 2 in., petiole ·25 to ·5 in. *Peduncles* flat, much curved, glabrous. *Flowers* 1 in. in diam., fascicled, peduncle ·5 to 1·5 in., hoary-pubescent. *Sepals* small, obtuse, ·2 in. long. *Petals*: the outer linear-oblong, obtuse, concave the saccate base small and sub-orbicular, 1 to 1·25 in. long and ·25 to ·35 broad; the inner smaller and narrower and much curved. *Ovaries* 3 or 4 ovoid, glabrous. *Ripe carpels* sessile, elliptic-globose, mammillate, yellow, glabrous, when ripe 2·5 in., long and 1·5 in. in diam. *Seeds* 2, plano-convex, testa stony.

Malacca; Maingay.

11. *ARTABOTRYS GRACILIS*, n sp. King. A slender woody climber, 60 to 80 feet long: young branches dark-coloured: all parts quite

glabrous except the petals. *Leaves* thinly coriaceous, ovate-lanceolate, shortly acuminate, the base cuneate; both surfaces glabrous and shining, the upper when dry tinged with green: main nerves 7 or 8 pairs, spreading, inter-arching inside the edge, very faint on both surfaces, reticulations rather distinct: length of blade 2·5 to 3 in., breadth 1 to 1·75 in., petiole ·15 to ·2 in. *Peduncles* extra-axillary, short, much hooked, glabrous, usually 4- to 6-flowered; pedicels ·35 in. long, thickened upwards, ebracteolate, glabrous: flower ·3 to ·4 in. long. *Sepals* very coriaceous, semi-orbicular, slightly pointed at the apex, very little conjoined at the base, concave, spreading. *Petals* fleshy, sub-equal, curved, spreading, densely tomentose, the outer 3 flattened; the inner obtusely 3-angled, tumid at the base, smaller than the outer 3. *Anthers* with broad apical connectival processes. *Ovaries* 3 or 4, oblong, with large discoid lobed stigmas, torus villous. *Ripe carpels* 3 or 4, sessile, obovoid, with several vertical ridges, the base contracted, glabrous, ·8 in. long and ·7 in. in diam. *Seeds* 2, compressed-ovoid, obtuse at each end, shining.

Perak: at low elevations, King's Collector, Nos. 3746, 4987 and 7543.

Allied to *A. suaveolens*, Bl.; but with differently shaped petals, pistils and carpels.

12. *ARTABOTRYS SUAVEOLENS*, Blume Fl. Javæ Anon. 62, t. 30, 31D. A climber 20 to 30 feet long; the petals always tomentose, the other parts mostly glabrous, but sometimes the young branches, peduncles, and under surfaces of the midribs of the leaves adpressed-puberulous. *Leaves* thinly coriaceous, oblong-lanceolate to ovate-lanceolate, acute or shortly acuminate, the base acute; both surfaces shining, the reticulations rather distinct, the upper often deeply tinged with green when dry. *Peduncles* extra-axillary, thin at first, but becoming stout and flat with age, glabrous or puberulous, bearing from 5 to 15 flowers; pedicels ·3 to ·45 in. long, thickened upwards, sparsely adpressed-pubescent, with a small narrowly ovate bract at the base; flowers about ·4 in. long. *Sepals* broadly ovate, the apex pointed, thinly coriaceous, sparsely adpressed-pubescent externally, very slightly conjoined at the base, spreading, ·1 in. long. *Petals* fleshy, adpressed-tomentose, dilated and thin at the base, the limb cylindrical to clavate, sub-erect, slightly spreading, sometimes with the apex incurved. *Anthers* short, with a very broad oblique flattened apical appendage from the connective; torus slightly pubescent. *Ovaries* broadly ovoid, sub-compressed, the stigma small. *Ripe carpels* few, ellipsoid, the apex blunt, the base slightly contracted, smooth, glabrous, ·4 to ·5 in. long and ·25 in. in diam.; pericarp thin, fleshy. *Seed* single, ellipsoid, blunt at each end, the testa granular. Wall. Cat. 6416; H. f. & T.

Fl. Ind., 129; Hook. fil. Fl. Br. Ind. I, 55; Miq. Fl. Ind. Bat. I. Pt. 2, 39 Ann. Mus. Lugd. Bat. II, 43; Kurz For. Fl. Burm. I; *Artabotrys parviflora*, Miq. Fl. Ind. Bat. Supp., 375. *Unona suaveolens*, Blume Bijdr. 17.

In all the Malayan Provinces at low elevations: common. Sylhet to Malacca in British India.

This species varies somewhat as to size of flowers and texture of leaf. The form named *A. parviflora* by Miq. in his Sumatra Supplement was, by himself, subsequently reduced to a variety of this species (Ann. Mus. Lugd. Bat. II, 38).

13. *ARTABOTRYS COSTATUS*, n. sp. King. A climber from 15 to 80 feet long: young branches slender, dark-coloured, scantily tawny-puberulous when young, afterwards glabrous. *Leaves* thinly coriaceous, elliptic-oblong, slightly oblanceolate, abruptly and shortly acuminate, the base cuneate; upper surface shining, glabrous except the lower part of the midrib which is tomentose; lower surface paler, dull, sparsely puberulous towards the base when young, afterwards glabrous; main nerves 12 to 14 pairs, spreading, forming one series of very bold arches .3 in. from the margin, with a series of smaller arches outside it, very stout and prominent on the lower, slightly so on the upper, surface, reticulations distinct on both: length of blade 7 to 9 in., breadth 2.5 to 3.25 in., petiole .2 in. *Peduncles* rather small, much hooked. *Flowers* unknown. *Carpels* (*unripe*) 2 to 5, sessile, ellipsoid, blunt at each end, about 1 in. long and .6 in. in diam. (*unripe*), glabrous: pericarp thin; seeds 2, elliptic.

Perak; on Ulu Bubong at elevations of from 500 to 800 feet, King's Collector, Nos. 4291 and 10184.

I have ventured to describe this although its flowers are unknown, and the only fruit collected is unripe. By its oblong costate leaves it differs from every other described *Artabotrys* except *A. macrophyllus*, mihi.

14. *ARTABOTRYS WRAYI*, King. A climber: young branches rather stout, softly pale rusty-tomentose; ultimately glabrous pale and furrowed. *Leaves* thinly coriaceous, large, oblong-elliptic to elliptic, shortly acuminate, the base rounded; both surfaces boldly reticulate; the upper glabrous and shining, sub-bullate when dry; the lower shortly and rather softly cinereous-pubescent; main nerves 10 to 12 pairs, oblique, curving, inter-arching freely within the edge, depressed above and bold and prominent beneath like the midrib; length 8 to 11 in., breadth 2.75 to 5 in., petiole .35 in., stout, tomentose when young, glabrescent when old. *Peduncles* extra-axillary, rather short, very thick in fruit, sometimes straight when young and curving only when in fruit, few-flowered, glabrous; pedicels 1 in. long, stout, softly tawny-tomentose with several

bracteoles at the base. *Flowers* 1 in. long. *Sepals* broadly ovate at the base, tapering rapidly upwards, acuminate, about .5 in. long, densely sericeous-tomentose outside, sub-glabrous inside especially at the base. *Petals* thick, sub-equal, ovate-oblong, sub-acute, slightly contracted above the claw, softly adpressed-sericeous except on the glabrous concavity of the claw inside. *Ovaries* numerous. *Ripe carpels* obovoid, tapering much to the base, the apex mucronate, densely tawny-tomentose, sessile; nearly 1 in. long.

Perak; Wray, King's Collector.

Next to *A. grandifolius*, this has the largest leaves of any of the Asiatic species of the genus, but from that species it differs in having them pubescent beneath. Only a single flower has hitherto been collected.

8. DREPANANTHUS, Maingay MSS.

Trces. *Leaves* large, pubescent beneath. *Racemes* very short, fasciated on woody truncal tubercles. *Sepals* 3, nearly free. *Petals* 6, valvate, 2-seriate, subequal; bases concave, connivent; limb erect or spreading, broad or narrow. *Stamens* many, cuneate, truncate; anthers linear, cells lateral; connective very slightly produced. *Ovaries* 4-12; stigma sub-sessile; ovules 4 or more, 2-seriate. *Ripe carpels* globose, several-seeded. Two species.

This genus differs from *Artabotrys* in its members being trees, not climbers; and in having 4 or more ovules in its ovaries. Dr. Scheffer (Ann. Jard. Bot. Buitenzorg II, 6) proposed to make it a section of *Cyathocalyx*.

Petals of both rows with more or less ovate limb 1. *D. pruniferus*.

„ „ with narrowly cylindrical limb 2. *D. ramuliflorus*.

1. DREPANANTHUS PRUNIFERUS, Maing. in Hook. fil. Fl. Br. Ind. I, 56. A tree 40 to 50 feet high; branches stout, rufous-pubescent at first, finally glabrescent. *Leaves* coriaceous, elliptic to elliptic-oblong, acute or obtuse, the base rounded or sub-cordate, often unequal; upper surface glabrous, except the depressed tomentose midrib and main nerves; lower surface shortly rufous-pubescent when young, glabrescent when adult; main nerves 14 to 16 pairs, prominent beneath; intermediate nerves stout, parallel, oblique; length 7.5 to 14 in., breadth 3 to 6.5 in.; petiole .5 to 1.5 in. stout, channelled. *Racemes* 6- to 8-flowered, crowded; flowers .75 in. long, their pedicels rufous-tomentose, .5 to .75 in. long, each with a large oblanceolate bract. *Sepals* and *petals* subequal, very coriaceous, densely covered (except the inside of the claws of the petals) with a layer of minute whitish tomentum; sepals united by their base, ovate-oblong, spreading; petals of outer row broadly ovate,

sub-acute, slightly constricted above the claw; those of the inner row closely connivent, much constricted above the claw, their apices broad and emarginate. *Ovaries* oblong, sericeous-tomentose. *Ripe carpels* 6 to 8, sessile, sub-globose, minutely pubescent to glabrescent, 1 to 1.25 in. in diam. *Seeds* numerous, oblong, flat, shining.

Malacca: Maingay (Kew Distrib.) No. 90. Perak; King's Collector, Scortechini. Penang, Curtis No. 1417.

2. DREPANANTHUS RAMULIFLORUS, Maing. Hook. fil. Fl. Br. Ind. I, 56. A tall tree, the young branches as in *D. pruniferus*. *Leaves* as in *D. pruniferus*, but slightly broader at the apex and narrowed at the base. *Flowers* .4 to .5 in long, much crowded in very short fascicles from tubercles on the branches below the leaves: pedicels about .3 in. long stout, rufous-tomentose as is the single sub-orbicular bracteole. *Sepals* much shorter than the petals, broadly triangular, acuminate, spreading, rufous-tomentose especially outside. *Petals* with concave, connivent, tomentose claw and fleshy, sub-cylindric, spreading, much curved, adpressed-pubescent limbs. *Ovaries* about 5, sessile, oblong. *Carpels* (young) ovoid, slightly oblique, densely rufous-tomentose; walls of pericarp very thick: seeds few: ripe fruit unknown.

Malacca: Maingay (Kew Distrib.), No. 91. Distrib. Sumatra; Forbes, No. 2913.

9. CANANGIUM, Baill. (*Cananga*, Rumph.)

Tall trees. *Leaves* large. *Flowers* large, yellow, solitary or fascicled on short axillary peduncles. *Sepals* 3, ovate or triangular, valvate. *Petals* 6, 2-seriate, subequal or inner smaller, long, flat, valvate. *Stamens* linear, anther-cells approximate, extrorse; connective produced into a lanceolate acute process. *Ovaries* many; style oblong (or 0?); stigmas sub-capitate; ovules numerous, 2-seriate. *Ripe carpels* many, berried, stalked or sessile. *Seeds* many, testa crustaceous, pitted, sending spinous processes into the albumen.—Two species.

The tree known as *Cananga odorata* H. f. and T. was by Rumphius (who wrote an account of it in Herb. Amb. II, 195, published in 1750) named *Cananga* (Latinice) and *Bonga Cananga* (Malaice). Rumphius' description is of the usual pre-Linnæan sort, there being no differentiation of generic and specific characters and his name of course is not binomial. In the chapter of his book following that in which *Cananga* proper is treated of (*l. c. p.* 197), Rumphius proceeds to describe the wild *Canangas* as distinguished from the *Cananga* proper, which was in his time, (as it is still) much cultivated by the Malays on account of the fragrance of its flowers. These wild *Canangas* Rumphius calls *Canangæ sylvestres* and of them he distinguishes three sorts.

1. *Cananga sylvestris prima sive trifoliata* (Malaice Oetan).
2. *Cananga sylvestris secunda sive angustifolia*.
3. *Cananga sylvestris tertia sive latifolia*.

Of the first two Rumphius gives figures on t. 66 of the same volume ; and judging from these figures, the plants fall into the modern genus *Polyalthia*.

Linnæus' *Species Plantarum* was published in 1753, therefore Rumphius' names are in point of time, as they are in point of form, pre-Linnæan. Linnæus does not accept *Cananga* as a genus and he refers to the *Cananga* of Rumphius only in a note under *Uvaria Zeylanica*. And the first botanists to adopt the *Cananga* of Rumphius as a genus are Hook. fil. and Thomson (in Fl. Ind. 130). But in 1775 Aublet (in his *Histoire des Plantes de la Guiane Francaise*), published, in regular Linnæan fashion, the genus *Cananga* for the reception of a single species named *C. ouregow* of which he gave a figure (t. 244). Nineteen years later (1794) Ruiz and Pavon, (in their *Prodromus Floræ Peruvianæ et Chilensis*), published under the name of *Guatteria* a genus with exactly the same characters as Aublet's *Cananga*. Unless therefore Hook f. and Thomson are right in making a special case in establishing, as a genus in the Linnæan sense, the *Cananga* of Rumphius, Aublet's genus *Cananga* must stand, and to it must be relegated all the American species referred to Ruiz and Pavon's genus *Guatteria*. Authorities vary in their treatment of the *Cananga* of Rumphius. Dunal (in his *Monographie de la famille des Anonacees*) pronounces for the suppression of Aublet's *Cananga* in favour of that of Rumphius who, he incorrectly says, assigned *two* species to it ; the fact being as already shown, that Rumphius divided *Cananga* into (a) cultivated (with one sort) and (b) wild (*sylvestres*) with three sorts. Dunal (and I think wrongly) refers all the *Cananga* of Rumphius to *Unona*. In their *Genera Plantarum*, Mr. Bentham and Sir J. D. Hooker retain the *Cananga* of Rumphius and reduce *Cananga* of Aublet to *Guatteria*. Baillon, on the other hand, retains the *Cananga* of Aublet as a genus, and to it refers all the S. American species of *Guatteria*. He reduces *Cananga odorata* H. f. and Th. to *Unona* and, altering the termination of its generic name, he makes it a section of *Unona* under the sectional title of *Canangium*.

The grounds for separating *Cananga* from *Unona* as a genus are thus stated by the authors of the *Flora Indica*. "In habit and general appearance this genus closely resembles *Unona* ; but the indefinite ovules prevent its being referred to that genus. The peculiar stamen (with a long conical apical point) and the seeds are themselves, we think, sufficient to justify us in distinguishing it as a genus." The simplest solution of the synonymic knot, and one for which there is some justi-

fiction on the ground of structure, appears to lie in the acceptance of Baillon's suggested name, giving up that of the authors of the *Flora Indica*.

The synonymy of *Gutteria* is further complicated by the fact that a large number of species with valvate æstivation were referred to it by Wallich and others. These, however, were separated by Hook fil. and Thoms. by whom the genus *Polyalthia* was formed for their reception. Sir Joseph Hooker refers to *Cananga*, not only the species *C. odorata*, but another named *C. virgata*. The latter plant appears to me, in the light of full material recently received, to be a typical *Cyathocalyx*, and to that genus I have ventured to remove it. A third species doubtfully referred to the genus *Cananga* under the specific name *monosperma*, appears to me from the description (I have seen no good specimen) to be so doubtful that I exclude it altogether. The seeds both of this species and of *C. Odoratum* are peculiar; I quote the following excellent description of those of *C. odoratum* from Hooker fil. and Thomson's *Flora Indica*, page 130. "The seeds are pitted like those of the section *Kentia* of *Melodorum*, and of some *Cucurbitaceæ*; and the inner surface of the brownish-yellow, brittle testa is covered with sharp tubercles, which penetrate into the albumen, taking the place of the flat plates which are found in the rest of the order."

Flowers 2 or 3 in. long 1 *C. odoratum*.
 ,, 1 to 1·25 in. long 2 *C. Scortechinii*.

1. CANANGIUM ODORATUM, Baill. Hist. des Plantes, I, 213 (*in note*).

A tree 30 to 60 feet high; young branches rather slender, sub-striate, at first puberulous, slightly lenticellate, dark ashy-coloured when dry. *Leaves* membranous, ovate-oblong or oblong-lanceolate, sometimes broadly elliptic, acute, shortly acuminate or sub-obtuse; the base rounded or sub-cuneate, unequal; quite glabrous, the midrib and nerves puberulous; main nerves about 8 pairs, ascending, rather straight and slender: length 3·5 to 8 in., breadth 1·75 to 3 in., petiole ·5 in. *Flowers* 2 to 3 in. long, drooping, in 2- to 3-flowered shortly pedunculate racemes: pedicels slender, 1·5 to 2 in. long, recurved, puberulous, with one median and several basal, small, often deciduous bracts. *Sepals* free or joined at the base only, about ·35 in. long, triangular, tapering to a blunt point, reflexed. *Petals* linear-lanceolate, 3 to 3·25 in. long and ·3 in. wide, adpressed-sericeous when young. *Ovaries* sessile, narrowly oblong: stigma hemispheric. *Ripe carpels* from 10 to 12, pedicellate, oblong-obovoid, glabrous, blunt, ·65 to ·9 in. long, nearly black when ripe, pulpy: stalks from ·5 to ·75 in. long. *Seeds* 6 to 12, flattened, sub-ovate. *Cananga odorata*, H. f. and Th. Fl. Ind. 130; Fl. Br. Ind. I, 56; Miq. Fl. Ind. Bat. I, Pt. 2, 40. Kurz For. Fl. Burm. I, 3. *Uvaria odorata*,

Lamb. Ill t. 495, f. 1; Roxb. Fl. Ind. ii. 661; Wall. Cat. 6457; W. & A. Prodr. 8; Blume Bijdr. 14, Fl. Jav. Anon. t. 9. Pierre Flore For. Coch. Chine, Anon. t. 18; Griff. Notul. iv. 712. *U. fracta*, Wall. Cat. 6460. *U. axillaris*, Roxb. Fl. Ind. ii. 667. *Unona odorata* and *U. leptopetala*, Dunal Anon. 108 and 114; DC. Prodr. i. 90 and 91; Deless. Ic. Sel. t. 88.

In all the provinces, planted. Indigenous in Tenasserim, Java, and the Philippines.

2. *CANANGIUM SCORTECHINII*, King n. sp. A tree 30 to 40 feet high: young branches puberulous but speedily glabrous, dark-coloured and lenticellate. *Leaves* membranous, broadly ovate, sub-acuminate, the base broad rounded, slightly oblique; both surfaces pubescent when very young, ultimately glabrescent, the midrib and 6 or 7 pairs of nerves adpressed-pubescent, glandular-dotted; length 2·5 in., breadth 1·5 in. (fide Scortechini; length 3 to 7 in., breadth 2 to 3 in.) *Cymes* short, from the axils of leaves or of fallen leaves, few-flowered, shortly pedunculate. *Flowers* 1 to 1·25 in. long; pedicels under 1 in., pale-pubescent with a narrow, ovate, obtuse, mesial bracteole ·25 in. long. *Sepals* ovate, sub-acute, recurved, minutely yellowish-pubescent, ·35 in. long. *Petals* subequal, linear-obtuse, 1·25 in. long; the claw short, thickened, pubescent on both surfaces like the sepals. *Stamens* numerous; the connective with an apical process, bulbous at the base, suddenly tapering into a sharp point. *Ovaries* numerous, oblong, glabrous except at the pubescent base, with 6 or 8 ovules in two rows; stigma sessile, truncate. *Ripe carpels* unknown.

Perak: Scortechini.

Scortechini's specimens are in bud only and none of them has any fruit. The foregoing description has been prepared partly from his notes and partly from his specimens. The species differs from *C. odoratum* in having smaller leaves, a different inflorescence, with smaller, quite inodorous, flowers. It is also a smaller tree.

Doubtful Species.

Cunanga? monosperma H. f. and Th. Fl. Br. Ind. I, 57. Of this I have seen only leaf-specimens.

10. *UNONA*, Linn.

Trees or shrubs, erect or climbing. *Flowers* often solitary, axillary terminal or leaf-opposed. *Sepals* 3, valvate. *Petals* 6, valvate or open in aestivation, 2-seriate; 3 inner sometimes absent. *Torus* flat or slightly concave. *Stamens* cuneate; anther-cells linear, extrorse, top of connective sub-globose or truncate. *Ovaries* numerous; style ovoid or oblong, recurved, grooved; ovules 2-8, 1-seriate (rarely sub-2-seriate). *Ripe*

carpels many, elongate and constricted between the seeds or baccate. *Seeds* few or many.—DISTRIB. Tropical Asia and Africa; species about 50.

Sect. I. DESMOS, H. f. and T. Petals 6, in two rows, ripe carpels jointed.

Flowers solitary and always axillary: leaves elliptic-oblong to oblong-lanceolate ... 1. *U. Dunalii.*

Flowers solitary, and extra-axillary, terminal or leaf-opposed.

Flower-peduncles 4 to 6 in. long, slender ... 2. *U. Desmos.*

Flower-peduncles 1 to 2 in. long.

Lower surfaces of leaves glaucous; petals glabrous or at most sparsely adpressed-sericeous ... 3. *U. discolor.*

Flower-peduncles from .5 to 1 in. long.

Leaves more or less oblong or ovate or lanceolate, rufous-pubescent or tomentose beneath ... 4. *U. dumosa.*

Sect. II. DASYMASCHALON. Petals 3, or sometimes only 2: the inner row always absent; ripe carpels jointed.

Flowers 3.5 to 6 in. long; petals linear-lanceolate, caudate-acuminate, not constricted between claw and limb ... 5. *U. longiflora.*

Flowers 1.5 to 3.5 in. long; petals from ovate to lanceolate, more or less constricted above the claw ... 6. *U. Dasymaschala*

Sect. III. STENOPETALON. Petals 6 in two rows, usually very narrow: carpels baccate, not jointed.

Flowers solitary ... 7. *U. Wrayi.*

Flowers in fascicles from the larger branches or stem.

Petals linear-oblong, 1 to 1.5 in. long; ripe carpels globose, glabrous, their stalks 1 to 1.5 in. long ... 8. *U. desmantha.*

Petals narrowly linear, 3 to 3.5 in. long: ripe carpels globose, densely rufous-velvety, shortly stalked ... 9. *U. crinita.*

Petals narrowly linear, 1.25 to 3 in. long: ripe carpels sub-globular or bluntly ovate, softly tomentose, ultimately sub-glabrous, sub-sessile ... 10. *U. stenopetala.*

1. UNONA DUNALII, Wall. Cat. 6425. A climber 60 to 100 feet long; young branches slender, rather pale, sub-rugose, lenticellate, glabrous. *Leaves* thickly membranous, pale when dry, elliptic-oblong

to oblong-lanceolate, acute or shortly acuminate, the base rounded, the upper surface glabrous, shining, the lower slightly glaucous, sometimes with a few scattered hairs on the midrib; main nerves 10 to 12 pairs, spreading, not prominent; length 3 to 4 in., breadth 1·2 to 1·75 in., petiole ·2 in. *Flowers* axillary, solitary, 1·25 to 1·4 in. long; pedicels ·35 to ·5 in long, slender, pubescent, with a minute bracteole about the middle. *Sepals* broadly ovate, acute, puberulous, reflexed, ·25 to ·3 in. long. *Petals* narrowly oblong-lanceolate, sub-acute, puberulous to glabrous, 1 to 1·25 in. long, the inner row smaller. *Ripe carpels* numerous, stalked, glabrous, constricted between the 3 to 5 ovoid joints, 1·25 to 1·75 in. long; the stalks about 1 inch. Hook. fil. and Th. Fl. Ind. 131, (excl. the Concan plant); Miq. Fl. Ind. Bat., I. Ft. 2, 41; Hook. fil. Fl. Br. Ind. I, 58.

Penang; Wallich. Perak; King's Collector.

2. *UNONA DESMOS*, Dunal Anon., 112. A spreading shrub, often climbing; young branches slender, striate, adpressed, rufous-pubescent, often lanceolate. *Leaves* thinly coriaceous, oblong, acute or acuminate, the base rounded; upper surface glabrous or nearly so, the midrib sparsely pubescent; under-surface paler in colour, puberulous or pubescent; main nerves 12 to 14 pairs, spreading, rather prominent beneath; length 4·8 to 8·8 in., breadth 1·65 to 3·25 in., petiole ·35 in. *Flowers* solitary, extra-axillary, 1·35 to 1·75 in. long; peduncle slender, 4 to 6 in. long, glabrous; bracts few, lanceolate, minute, deciduous. *Sepals* ovate-acuminate, spreading, adpressed-pubescent, ·3 in. long. *Petals* coriaceous, ovate-lanceolate, adpressed-pubescent, nerved; the outer 2 in. long by about ·85 in. broad; the inner smaller. *Ripe carpels* numerous, stalked, ·5 to ·75 in. long, glabrous, constricted between the 2 to 3 oval joints. H. f. and T. Fl. Ind. 134; Miq. Fl. Ind. Bat. I, Pt. 2, 42; Hook. fil. Fl. Br. Ind. I, 59; Kurz For. Fl. Burm. I 34. *U. cochinchinensis* A. DC Prod. I, 91; *U. pedunculosa*, A. DC Mem. Anon 28; *U. pedunculosa* Wall. Cat. 6422. *U. fulva*, Wall. Cat. 6427. *Desmos cochinchinensis* Lour. Fl. Coch. Ch. I, 352. *U. discolor*, Wall. (not of Roxb.) Cat. 6420 D and E.

From Assam to Singapore. Distrib. Cochin-China.

3. *UNONA DISCOLOR*, Vahl Symb. II, 63, t. 36. A spreading shrub, often also climbing; young branches slender, sub-rugose, pubescent towards the tips. *Leaves* membranous, oblong or oblong-lanceolate, acute, the base rounded; upper surface glabrous, shining; the lower glaucous, glabrous or pubescent; main nerves 8 to 10 pairs, sub-ascending, slightly prominent beneath; length 3 to 7·5 in., breadth 1 to 2 in., petiole about ·25 in. *Flowers* solitary, extra-axillary, 2 to 2·5 in. long; peduncles 1 to 2 in. long, rather slender, pubescent, with a minute linear

bracteole below the middle, thickening when in fruit and lenticellate. *Sepals* ovate-lanceolate, spreading, nearly glabrous, .4 to .6 in. long. *Petals* coriaceous, narrowly lanceolate, 2 to 2.5 in. long, glabrous or sparsely adpressed-sericeous. *Ovaries* oblong, hairy. *Stigma* laterally grooved. *Ripe carpels* numerous, stalked, .75 to 1.5 in. long, glabrous or pubescent, the constrictions between the 2 to 5 oval joints pubescent; stalks .25 in. long. Dunal Anon. 111; DC. Prodr. i. 91; Wall. Cat. 6420 (*partly*); Roxb. Fl. Ind. ii. 669; W. & A. Prodr. 9; H. f. & T. Fl. Ind. 133; Miq. Fl. Ind. Bat. I, Pt. 2, 41; Beddome Ic. Pl. Ind. Or. t. 51; Bl. Fl. Javæ Anon. 53; A. DC. Mem. 28; W. and A. Prod. 9; Thwaites Enum. 9; Kurz For. Fl. Ind. Burm. I. 34; Hook. fil. Fl. Ind. I, 59. Scheff. Obs. Phyt. Anon. 5. Nat. Tidsch. Ned. Ind. XXXI, 5. *U. cordifolia*, Roxb. Fl. Ind. II, 602? *U. Dunalii*, H. f. & T. Fl. Ind. 131 (the Concan plant); Dalz. & Gibs. Fl. Bomb. 3 (not of Wallich). *U. Anherstiana*, A. DC. Mem. 28. *U. biglandulosa*, Bl. Bijdr. 16. *U. Roxburghiana*, Wall. Cat. 6423 B. *U. Lessertiana*, Dunal Anon. 107. t. 26; DC. Prod. I, 90. *Desmos chinensis* Lour. Fl. Coch. Ch. I, 352.

Of this variable and abundant species, Sir Joseph Hooker distinguishes four varieties as follows:—

Var. 1, *pubiflora*; leaves 5–7 in., oblong acute, base often cordate, flowers silky.

Var. 2, *lævigata*; leaves 3–4 in., oblong or lanceolate, acute, base rounded, flowers almost glabrous.—*U. chinensis*, DC. Prodr. i. 90. *U. undulata*, Wall. Pl. As. Rar. iii. and 42. *U. discolor*, Dalz and Gibs, Fl. Bomb. 3. t. 265; Wall. Cat. 6428.—Perhaps cultivated only in India, common in the Archipelago and China.

Var. 3, *pubescens*; leaves as in 1, but densely pubescent beneath.

Var. 4, *latifolia*; leaves 3–5 by 2–2½ in., broad-oval, acute, flowers silky. *U. discolor* and var. b, *bracteata* Bl. Fl. Jav. Anon. 53, t. 26 and 31A.

From the base of the eastern Himalaya through the Assam range to Burmah and the Malayan Peninsula; in tropical forests. Distrib. The Malayan Archipelago, Chinese Mountains.

4. *UNONA DUMOSA*, Roxb. Fl. Ind. II, 670. A large bushy climber: young branches slender, softly rufous-tomentose. *Leaves* membranous, broadly ovate to oblong-ovate, obovate to oblanceolate-oblong, obtuse, sub-acute or broadly mucronate, the base rounded or sub-cordate, or sub-cuneate; when young rufous-tomentose on both surfaces; the upper except the midrib glabrescent when old: main nerves 10 to 12 pairs, sub-ascending, rather straight; length 2 to 5.25 in., breadth 1.25 to 2.5 in.; petiole .15 in., to 3 in., rufous-tomentose. *Flowers* solitary, leaf-opposed or extra-axillary, 2 to 2.5 in. long; pedicels .5 to .75 in. long,

rufous-tomentose, with a single ovate bract near the base. *Sepals* coriaceous, cordate or ovate, sub-acute or acute, spreading, rufous-tomentose, .4 in. long. *Petals* obovate-spathulate to broadly ovate-lanceolate, tapering to each end, vertically nerved, densely pubescent at first, less so when old; the inner row smaller. *Ripe carpels* numerous, stalked, glabrous, .75 to 1.4 in. long, much constricted between the 2 to 3 ovoid joints. *Seeds* shining, the albumen with transverse fibres. Wall. Cat. 6429. H. f. and Th. Fl. Ind. 131; Hook. fil. Fl. Br. Ind. I, 59.

Malacca: Maingay, Nos. 42 and 43 (Kew Distrib.). Perak; King's Collector, L. Wray Junior. Sylhet; Roxburgh, Wallich. Assam; Simons.

The form which occurs in the Malayan Peninsula has narrower petals than that which is found in Assam and Silhet, and its leaves are more oblong and less ovate.

5. *UNONA LONGIFLORA*, Roxb. Fl. Ind. II, 668. A glabrous shrub or small tree, the leaf-buds silky; young branches slender. *Leaves* membranous, narrowly oblong or oblong-lanceolate, more or less acuminate, the base rounded or slightly cuneate; upper surface shining, the lower glaucous: main nerves 12 to 16 pairs, oblique, rather prominent beneath: length 6.5 to 11 in., breadth 1.75 to 3.25 in., petiole .4 in. *Flowers* solitary, pedunculate, axillary, pendulous, 3.5 to 6 in. long; the peduncles minutely bracteolate and jointed near the base, slender, from 1.25 to 8 in. long, still longer in fruit. *Sepals* very small, broadly triangular, spreading, mucronate, rufous-pubescent externally. *Petals* linear-lanceolate, much acuminate, cohering by their margins, the base slightly expanded, no constriction between the limb and claw, adpressed-sericeous when young but afterwards glabrous, yellowish; the inner row absent. *Stamens* with the connective produced and truncate at the apex. *Ovaries* 10 to 20, sessile, hairy; *ovules* few: stigmas large, recurved. *Ripe carpels* about 10, stalked, moniliform, 3- to 4-jointed, all the joints except the lowest often falling off: individual joints elongated-ovoid, .5 in. long, glabrous. *Seeds* with thin smooth testa, the albumen intersected by numerous horizontal fibrous processes. Wall. Cat. 6419; Hook. fil. and Th. Fl. Ind. 134; Hook. fil. Fl. Br. Ind. I, 61; Kurz Fl. Burm. I, 35.

Perak; in forests under 3,000 feet. E Himalaya; Assam; Khasia Hills, Chittagong.

Most of the specimens which I have seen from Assam, the Khasia Hills, and Chittagong have flower-pedicels under 2 inches long, and petals quite 6 inches long. Specimens from Perak, on the other hand, have shorter flowers (3 to 4 in. long); and much longer (5 or 6 in.) and more slender peduncles: otherwise the two sets agree. In many of the flowers from both sets of localities there are only two petals.

6. *UNONA DASTMASCHALA*, Blume Fl. Jav. Anon. 55, t. 27. An erect or sarmentose shrub: young branches sometimes glabrous from the beginning, but usually at first softly rufous-pubescent and sometimes permanently so. *Leaves* thinly coriaceous, elliptic-oblong, oblong, or oblong-lanceolate or oblanceolate, acute or shortly acuminate, the base rounded or narrowed; upper surface glabrous; the lower sub-glaucous, glabrous or sometimes puberulous on the midrib and nerves; length 4·5 to 8·5 in., breadth 1·5 to 3 in., petiole about 1 in. *Flowers* pedunculate, solitary, axillary, pendulous, 1·5 to 3 in. long; peduncles 1·25 to 1·75 in. (longer in fruit), minutely bracteolate at the very base. *Sepals* fleshy, very short, broadly triangular, pubescent, reflexed. *Petals* fleshy, varying from ovate-acute to lanceolate-acuminate, concave and (in the narrower forms) expanded at the base, with a constriction between the claw and limb; the edges united when young, adpressed-puberulous but ultimately glabrous. *Anthers* with the connective expanded at the apex and oblique. *Ovaries* densely villous; the stigma narrow, glabrous. *Ripe carpels* numerous, shortly stalked, moniliform, pubescent to glabrous, the joints oval, about 35 long. *Seeds* oval, smooth, the albumen with fibrous processes. A. DC. Mem. Anon. 28; Wall. Cat. 6421; Hook. fil. and Thoms. Fl. Ind. 135; Miq. Fl. Ind. Bat. I, Pt. 2, 42; Kurz Fl. Burm. I, 36; Hook. fil. Fl. Br. Ind. I, 61. Scheff. Obs. Phyt. Anon. 6; Nat. Tidsch. Ned. Ind. XXXI, 6.

From Burmah to Singapore; the Andaman Islands. Distrib.—Sumatra, Java.

Var. *Blumei*, Hook. fil.; branches glabrous; leaves pale-yellowish or grey beneath, glabrous or nearly so. Wall. Cat. 6420 B. (*U. discolor*.)

Var. *Wallichii*, Hook. fil.; branches brown-tomentose; lower surfaces of leaves glaucous and tinged with purple.

This species, in the absence of the inner row of petals and in other respects, resembles *M. longiflora*, Roxb.; but the outer petals are neither so long nor so narrow, and there appear always to be three of them, and not often only two as in *M. longiflora*. The peduncles are moreover shorter. The two species, however, are closely allied. In open, exposed situations this is a non-scandent bush; but under the shade of trees, it often develops into a climber,—a habit which it shares with many species of this family. Blume's figure of this plant (quoted above) is inaccurate as respects the flowers and fruit.

7. *UNONA WRAYI*, Hemsl. in Hook. Ic. Plant t. 1553. A tree: young branches slender, tawny-tomentose. *Leaves* thickly membranous, elliptic-oblong, shortly acuminate, often obtuse (from the breaking off of the acumen), slightly narrowed to the rounded base; upper surface glabrous except the puberulous midrib; lower much reticulate,

puberulous, the midrib pubescent : main nerves 8 to 10 pairs, rather prominent beneath, spreading, and forming two sets of intra-marginal arches : length 5·5 to 7·5 in., breadth 2 to 2·65 in. ; petiole ·2 in., tomentose. *Flowers* 3 to 3·5 in. long, solitary or in fascicles from tubercles on the larger branches : pedicels ·75 to ·9 in., slender. *Sepals* ovate-lanceolate, sub-acute, about ·3 in. long, puberulous. *Petals* white changing to deep claret, subequal, rather coriaceous, linear-lanceolate, acuminate, about 3 in. long, sparsely puberulous outside : breadth about ·3 in. *Ovaries* numerous, pubescent, with about 4 ovules. *Ripe carpels* red when ripe, stalked, slightly pulpy, ovoid or oblong, obtuse, glabrous, 1 to 1·25 in. long : stalks ·5 to ·75 in. long. *Seeds* about 3, oval, compressed, rugulose, aromatic, ·6 in. long.

Singapore ; Maingay (Kew Distrib.), No. 51. Perak ; Wray, No. 560 ; King's Collector. Distrib.—Java.

8. *UNONA DESMANTHA*, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 61. A small tree : youngest branches with soft yellowish-brown pubescence, the older with smooth, shining, yellowish-brown bark. *Leaves* coriaceous, elliptic-oblong, or elliptic-lanceolate, or oblanceolate, shortly and acutely or obtusely acuminate, the base acute ; upper surface glabrous except the pubescent midrib ; under-surface paler, puberulous especially on the midrib and nerves : main nerves 8 to 11 pairs, rather prominent beneath when dry, oblique. *Flowers* 2·5 in. diam., pale red, densely crowded on 1 to 2 in. broad flat tubercles on the older branches : peduncles ·75 in., puberulous, ebracteolate. *Sepals* ovate, acute, ·3 in. long. *Petals* unequal, linear-oblong, tapering to the apex, the base not dilated, sparsely pubescent, 1 to 1·5 in. long ; the inner rather narrower. *Torus* and *ovaries* as in *U. pycnantha*, but ovules 3 to 5, superposed. *Ripe carpels* stalked, globose, dark-coloured, glabrous, nearly 1 in. in diam. : stalk 1 to 1·5 in.

Malacca : Maingay (Kew Distrib.), No. 48.

9. *UNONA CRINITA*, Hook. fil. and Thoms. Fl. Br. Ind. I, 61. A tree ? young branches slender ; their bark pale, rugose ; the youngest densely rufous-tomentose. *Leaves* membranous, oblong, elliptic-oblong or oblanceolate-oblong, acute or acuminate ; the base rounded ; upper surface quite glabrous, the lower pubescent especially on the nerves and veins : the midrib tomentose on both surfaces ; main nerves 10 to 12 pairs, slender, but slightly prominent beneath : length 3 to 8 in., breadth 1·25 to 2·5 in. ; petiole ·15 in., tomentose. *Flowers* 3 to 5 in. long, pedicellate, in dense crowded fascicles from very broad (1 to 2 in. in diam.) tubercles on the larger branches ; pedicels ·15 to ·25 in. long, rusty-tomentose ; bracteole linear, or absent. *Sepals* ovate-lanceolate, much acuminate, spreading, ·5 in. to ·75 in. *Petals* subequal in length,

narrowly linear, unequal in breadth, .15 in. broad at the base, and at the middle, narrower between and from the middle upwards; 1-nerved; finely pubescent; the inner slightly shorter and narrower. *Torus* columnar, truncate. *Ovaries* strigose: ovules 3 to 5, 1-seriate: stigma punctiform. *Ripe carpels* globose, densely rufous-velvety, shortly stalked.

Malacca: Maingay (Kew Distrib.), No. 41.

10. *UNONA STENOPETALA*, Hook. fil. and Thoms. Fl. Ind. 136. A tree 20 to 35 feet high: young branches softly rufous-tomentose; the older dark-coloured, glabrous, striate. *Leaves* thinly coriaceous, oblong-obovate or oblanceolate, more or less acuminate, narrowed below to the slightly cordate and oblique base: both surfaces glabrous, the midrib more or less pubescent on the lower; under-surface faintly reticulate when dry; main nerves 7 to 9 pairs, curving upwards, anastomosing doubly at some distance from the edge, thin but slightly prominent: length 4 to 7 in., breadth 1.25 to 3 in.; petiole .1 to .25 in., rufous-tomentose. *Flowers* 1.5 to 2 in. long, almost sessile or shortly pedicelled, in fascicles of 2 to 4 on minutely bracteate extra-axillary tubercles from both branches and stem. *Sepals* united at the base, lanceolate, acuminate, the bases broad, ribbed, spreading, pubescent externally, .4 to .5 in. long. *Petals* sub-equal, narrowly linear, concave, slightly wider at the base, keeled, sparsely pubescent, 1.25 to 3 in. long. *Stamens* numerous, short with broad flat apices hiding the lateral anthers. *Ovaries* 4 to 7, villous, 4- or 5-ovuled. *Ripe carpels* few, sub-globular or bluntly ovate, softly tomentose at first, ultimately sub-glabrous; the pericarp thick, .5 to .65 in. long and .5 in. in diam. *Seeds* 1 to 3, thickly discoid, bi-concave with grooved edge, rugulose. Hook. fil. and Th. Fl. Br. Ind. I, 60: Miquel Fl. Ind. Bat. I, pt. 2, 43: Kurz F. Flora Burma, I, 35.

Singapore: Lobb, Ridley. Penang: King's Collector, Scortechini; common. ? Burmah, (in Tenasserim): Lobb.

This is a rare plant in Burmah, if indeed it occurs there at all. The leaves of some of the Perak specimens have petioles .5 in. long: but usually they are as above described.

11. *POLYALTHIA*, Blume.

Trees or shrubs with the habit of *Unona*. *Sepals* 3, valvate or sub-imbricate. *Petals* 6, 2-seriate, ovate or elongated, flat or the inner slightly vaulted. *Torus* convex. *Stamens* cuneate; anther-cells extrorse, remote. *Ovaries* indefinite; style usually oblong; ovules 1-2, basal and erect, or sub-basal and ascending. *Ripe carpels* 1-seeded, berried.—
DISTRIB. Tropical Asiatic sp. about 45; African sp. 3; Australasian species 2.

Sect. I. MONOON. Ovule solitary, usually basal, erect.

Flowers from the axils of the leaves or of fallen leaves, not from the trunk.

Flowers solitary.

Leaves under 5 in. in length (7 in. in *P.*

Sumatrana), more or less lanceolate.

Leaves not glaucous beneath; petals ovate, acute

1. *P. dumosa.*

Leaves very glaucous beneath; petals linear-oblong, obtuse.

Ripe carpels smooth

2. *P. hypoleuca.*

Ripe carpels vertically ridged

3. *P. sumatrana.*

Leaves over 5 in. in length, not glaucous.

Flowers axillary.

Petals more or less narrowly lanceolate.

Leaves ovate-lanceolate, glabrous; ripe carpels oblong, blunt at each end

4. *P. andamanica.*

Leaves oblong to obovate-oblong, more or less pubescent; ripe carpels elliptic, mucronate

5. *P. magnoliaeflora.*

Petals oblong-elliptic, slightly obovate, 1·3 to 2·25 in. long

6. *P. macrantha.*

Flowers terminal; petals ovate-elliptic, 1 to 1·25 in. long

7. *P. pulchra.*

Flowers solitary or in pairs; ripe carpels little more than ·25 in. long.

Flowers ·4 in. in diam.; petals broadly oblong-ovate, obtuse

8. *P. Kunstleri.*

Petals 1·5 to 2 in. long, lanceolate-oblong; leaves narrowly lanceolate-oblong or elliptic-oblong

9. *P. Scortechinii.*

Petals ·85 to 1·5 in. long, broadly lanceolate or oblanceolate; leaves oblong-lanceolate to ovate-elliptic... ..

10. *P. Jenkinsii.*

Flowers in pairs; petals obovate-oblong, 1 in. long; ripe carpels ovoid; ·65 in. long

11. *P. Hookeriana.*

Flowers always in fascicles or cymes, axillary or from the branches below the leaves

12. *P. simiarum.*

Flowers in fascicles from the young branches

below the leaves, or from the larger branches ;
never axillary.

Leaves 8 to 15 in. long with 12 to 16
pairs of prominent oblique or spread-
ing nerves 13. *P. lateriflora*.

Leaves 6 to 8 in. long with 10 to 12
pairs of slender, spreading nerves... 14. *P. sclerophylla*.

Flowers in fascicles from tubercles on the main
stem, often near its base ; never axillary, and
probably never from the branches.

Inflorescence ærial,

Leaves under 8 in. in length.

Leaves oblong-lanceolate ;
nerves 8 or 9 pairs ; torus
of ripe fruit 1·25 in. in
diam. : stalks of ripe carpels
·75 in. long ... 15. *P. macropoda*.

Leaves oblong ; nerves 7
pairs ; torus of ripe fruit ·5
in. in diam ; stalks of ripe
carpels 1·5 in. long ... 16. *P. clavigera*.

Leaves elliptic to oblong,
slightly oblique ... 17. *P. glomerata*.

Leaves 9 to 16 in. long ; oblong-
elliptic ... 18. *P. congregata*.

Inflorescence sub-hypogæal ... 19. *P. hypogæa*.

Sec. II. EUPOLYALTHIA. Ovules 2 (3 in *P. Korinti*), superposed.

Flowers solitary.

Leaves under 5 in. long, not cordate at the
base.

Leaves oblong-lanceolate.

Petals oblong ... 20. *P. obliqua*.

Petals broadly ovate or ovate-
orbicular, leaves glaucous ... 21. *P. aberrans*.

Leaves upwards of 5 in. long, cordate at
the base.

Petals narrowly linear ... 22. *P. bullata*.

Petals oblong.

Flowers 1 in. diam... 23. *P. subcordata*.

Flowers 1·25 to 1·75 in. in diam. 24. *P. oblonga*.

Flowers in fascicles from the older branches.

Petals linear-oblong, 1 to 1·5 in. long : ripe

- carpels $\cdot 35$ in. long, their stalks $\cdot 6$ to $\cdot 75$
 in. long 25. *P. Beccarii*.
 Petals linear-oblong, 2 to 3 in. long; ripe
 carpels $\cdot 75$ to 1 in. long, sub-sessile ... 26. *P. cinnamomea*.
 Petals oblong-lanceolate or oblanceolate, $\cdot 9$
 to $1\cdot 5$ in. long; ripe carpels $1\cdot 75$ in. long,
 their stalks $\cdot 25$ in. long 27. *P. pachyphylla*.
 Petals linear, obtuse, $\cdot 5$ to $\cdot 75$ in. long ... 28. *P. pycnantha*.

1. *POLYALTHIA DUMOSA*, King n. sp. A shrub; young branches slender, glabrous. *Leaves* thinly coriaceous, lanceolate or oblong-lanceolate, acuminate, the base rounded; both surfaces dull, glabrous, very minutely lepidote; main nerves 8 or 9 pairs, spreading, faint, inter-arching far from the margin; length $2\cdot 5$ to $3\cdot 25$ in., breadth $\cdot 5$ to $\cdot 9$ in., petiole less than $\cdot 1$ in. *Flowers* solitary, leaf-opposed, $\cdot 3$ to $\cdot 35$ in. long; pedicels slender, glabrous, $\cdot 3$ to $\cdot 4$ in. long with a small lanceolate bractlet about the middle. *Sepals* thick, spreading, broadly ovate, acute or acuminate, $\cdot 1$ in. long, glabrescent outside, quite glabrous inside. *Petals* leathery, subequal, narrowly oblong, acuminate, not widened at the base, sub-corrugated and glabrous outside, puberulous inside, 3 in. long. *Stamens* numerous, short; the apical process very broad, rhomboid, truncate, projecting much over the apices of the short dorsal anther-cells. *Ovaries* very few, oblong, pubescent; stigma broad, sessile, hairy. *Ripe carpels* one or two, ovoid-globose, glabrous, cherry-red when ripe, $\cdot 25$ to $\cdot 3$ in. long.

Perak; elevat. about 1,200 feet; Wray, Scortechini.

Near *P. suberosa*, H. f. and Th. but with different venation, fewer carpels, and without hypertrophied bark.

2. *POLYALTHIA HYPOLEUCA*, Hook. fil. and Thoms. in Fl. Br. Ind. I, 63. A tree 50 to 80 feet high; young branches slender, rather pale, striate; all parts glabrous except the flowers. *Leaves* coriaceous, oblong-lanceolate or elliptic-lanceolate, shortly acuminate, the base acute, the edges slightly recurved when dry, upper surface shining, the lower dull, pale: main nerves many pairs, invisible on either surface except in some occasional leaves when dry: length $2\cdot 5$ to 5 in., breadth $\cdot 75$ to $1\cdot 75$ in., petiole $\cdot 2$ to $\cdot 3$ in. *Flowers* sub-erect, small (only $\cdot 3$ to $\cdot 4$ in. long) pedicelled, solitary or sub-fascicled, mostly from the axils of fallen leaves: pedicel stout, about $\cdot 15$ in. long, tomentose and with about two cucullate bracts near the base. *Sepals* very small, triangular, pubescent, deciduous. *Petals* linear-oblong, obtuse, not dilated at the base, grey-pubescent on both surfaces. *Ripe carpels* few, often solitary, stalked, elliptic-oblong, obtuse, glabrous, $\cdot 8$ in. long: stalks $\cdot 1$ to $\cdot 25$ in. *Seed* ovoid-elliptic, blunt, dark-coloured, transversely striate.

Singapore: Maingay, No. 50, (Kew Distrib.) Perak; King's Collector.

This approaches *Guatteria sumatrana*, Miq. in its leaves: but that species has much larger flowers. But this is still more allied to *Guatteria hypoglauca*, Miq., from which it differs by its much larger fruit. The plant named *P. hypoleuca* by Kurz in his Forest Flora of Burmah is, as he himself informed Sir Joseph Hooker in a letter, really *P. sumatrana*. Neither species, however, appears to me to occur either in the Andamans or Burmah.

3. *POLYALTHIA SUMATRANA*, King (not of Kurz.) A tree 30 to 60 feet high: young branches pale, the older much furrowed: all parts glabrous except the flowers. *Leaves* coriaceous, oblong-lanceolate, acuminate, the base acute; upper surface shining, the lower dull glaucous, both pale (when dry); main nerves 15 to 20 pairs, very slender and little more prominent than the secondary; length 4·5 to 6·5 in., breadth 1·25 to 1·75 in., petiole ·25 in. *Flowers* 1·4 to 1·75 in. long, solitary or in fascicles of 2 or 3 from the younger branches below the leaves, or axillary; their pedicels ·6 to ·9 in. long, minutely bracteolate near the base, glabrous. *Sepals* very small, half-orbicular-ovate. *Petals* narrowly linear-oblong, sub-acute or obtuse, puberulous, pale green to yellowish, the outer slightly longer than the inner, 1·35 to 1·75 in. long and ·15 to ·2 in. broad. *Ovaries* glabrous, sub-cylindric, with a single ovule: stigma hairy. *Carpels* ovoid, tapering to each end, ridged (when dry), pubescent or glabrous, about 1 in. long and ·6 in. in diam.; their stalks ·5 to ·6 in. long. *Guatteria sumatrana*, Miq. Fl. Ind. Bat. Suppl. 380. *Monoon sumatranum*, Miq. Ann. Mus. Lugd. Bat. II, 19.

Perak; at elevations up to 2,500 feet, common. Distrib.: Sumatra, Korthals, Beccari P. S., No. 613. Borneo, Korthals.

This is allied to *P. hypoleuca*, H. f. and Th.; but has larger leaves, much larger flowers, and slightly different carpels.

4. *POLYALTHIA ANDAMANICA*, Kurz Andam. Report (1870) p. 29. A shrub: young branches slender, tomentose. *Leaves* membranous, ovate-lanceolate, acute; the base broad and rounded, slightly unequal; some of the larger nerves underneath and the midrib on both surfaces pubescent near the base, otherwise glabrous and shining; main nerves 6 or 7 pairs, distant, spreading and forming bold arches far from the margin: reticulations minute, distinct: length 4·5 to 6 in., breadth 2 to 2·4 in.; petiole ·2 in., pubescent. *Flowers* axillary or extra-axillary, solitary, 2 in. in diam.; the pedicel ·4 to ·75 in. long, sub-pubescent, minutely bracteolate. *Sepals* minute (·1 in. long), broadly triangular, pubescent. *Petals* thinly coriaceous, sub-equal, oblong, blunt, 1 in. long. *Ripe carpels* 6 to 8, oblong, smooth, glabrous, slightly apiculate, ·5 or ·6 in.

long and .15 to .2 in. in diam., their stalks nearly as long. *P. Jenkinsii*, Benth. and Hook. fil. in Hook. fil. Fl. Br. Ind. I, 64 (*in part*); Kurz Flora Burm. I, 38.

S. Andaman: Kurz, Man, King's Collector.

Allied to *P. Jenkinsii*, H. f. and T.; but with much smaller flowers, and leaves with broader bases.

5. *POLYALTHIA MAGNOLIEFLORA*, Maing. MSS. Hook. fil. Fl. Br. Ind. I, 64. A tree 30 to 40 feet high; young branches rusty-tomentose. *Leaves* thinly coriaceous, oblong to obovate-oblong, obtuse or acuminate, the base rounded or minutely cordate; upper surface glabrous, the nerves and midrib minutely tomentose; under surface at first pubescent, ultimately glabrous or glabrescent: main nerves 15 to 20 pairs, rather straight, oblique, prominent beneath, the transverse veins almost straight, distinct; length 8 to 12 in., breadth 2.5 to 3.5 in.; petiole .25 in. stout, tomentose. *Flowers* large, shortly pedunculate, solitary, axillary, 2.5 to 3 in. long; peduncle .3 in. long, tomentose, with 2 large ovate bracts. *Sepals* coriaceous, short, broadly ovate, acute, spreading, tomentose. *Petals* coriaceous, white, linear-oblong or oblong-lanceolate, sub-acute, tomentose. *Torus* conical. *Ovaries* hirsute. *Carpels* (unripe) stalked, oblong-ovoid, blunt at either end, the apex mucronate, pubescent. *Seed* with smooth shining testa.

Malacca: Maingay. Perak; King's Collector, No. 10039.

Evidently a rare species. I have seen only Maingay's imperfect specimens from Malacca, and two collected on Ulu Bubong by the late Mr. H. H. Kunstler, Collector for the Bot. Garden, Calcutta. Sir J. D. Hooker states (F. B. Ind. l. c.) on Maingay's authority that the flowers have the colour and odour of those of a *Magnolia*.

6. *POLYALTHIA MACRANTHA*, King n. sp. A tree 20 to 70 feet high; young branches rather slender, glabrous. *Leaves* large, thinly coriaceous, oblong to elliptic-oblong, acute, slightly narrowed below the middle to the rounded or minutely cordate base; upper surface shining, glabrous except the depressed slightly puberulous midrib; lower surface paler when dry, glabrous, very minutely lepidote; main nerves 20 to 24 pairs, spreading, thin but prominent beneath; length 12 to 18 in., breadth 4.5 to 7.5 in., petiole .4 in., stout. *Flowers* solitary, axillary or slightly supra-axillary, 2.5 to 4.5 in. in diam.; pedicels 1.5 to 2 in. long (longer in fruit) glabrescent, with a sub-orbicular bracteole about the middle; the buds conical when young. *Sepals* thick, sub-orbicular, spreading, connate by their edges and forming a cup .75 in. in diam., puberulous on both surfaces, corrugated outside. *Petals* much larger than the sepals, white, thick, fleshy, flattish, oblong-elliptic, widest above the middle, blunt, puberulous on both surfaces except at the glabrescent

bases, nerved inside; the outer row 1·3 to 2·5 in. long, the inner smaller. *Stamens* numerous, compressed; apical process of connective truncate. *Ovaries* few, oblong, puberulous; stigmas large, capitate-truncate, pubescent. *Ripe carpels* elliptic-ovoid, sometimes oblique, blunt at each end, the apex mucronate, glabrous, 1 to 1·25 in. long, and ·75 in. in diam. *Seed* ovoid, solitary, the testa corrugated.

Perak; King's Collector, Scortechini.

A remarkable species with handsome white flowers, allied in many ways to *P. congregata*; but at once distinguished from it by its axillary, solitary flowers and glabrous ripe carpels.

7. *POLYALTHIA PULCHRA*, King. A small tree, glabrous except the inflorescence. *Leaves* thinly coriaceous, elliptic to oblong-lanceolate or oblong-ob lanceolate, acute or acuminate, the base acute; both surfaces minutely muriculate, the lower paler and dull; length 4·5 to 6 in., breadth 2·5 in. (only 1·75 in. in var. *angustifolia*), petiole ·25 in. *Flowers* large, solitary, terminal, 2 in. or more in diam. when expanded (often 3·5 in. in diam. in var. *angustifolia*): pedicels 1·4 to 1·75 in. long, puberulous, with a lanceolate foliaceous bracteole at the base. *Sepals* ovate, acute or sub-acute, nerved, glabrous, ·6 to ·75 in. long. *Petals* coriaceous, sub-equal, ovate-elliptic, sub-acute, the base slightly cordate (narrowly oblong-lanceolate in var. *angustifolia*) greenish-yellow with a triangular blotch of dark purple at the base. *Stamens* numerous; apical process of connective broad, truncate, sub-orbicular, projecting over the apex of the linear anther-cells, pubescent. *Ovaries* oblong, adpressed-pubescent, 1-ovuled; style short, cylindric, thick, crowned by the convex, terminal, pubescent stigma. *Ripe carpels* numerous, elliptic-ovoid, blunt, slightly contracted at the base, sparsely pubescent but becoming almost glabrous, purple when ripe; pericarp sub-succulent: stalks thick, crimson when ripe, 1·5 in. long. *Seed* solitary, elliptic.

Perak: at Weld's Rest, Scortechini.

Var. *angustifolia*, King. *Leaves* oblong-lanceolate or oblong-ob lanceolate, scarcely muriculate; petals lanceolate or narrowly oblong-lanceolate, often 1·75 in. long; sepals often ·75 in. long.

Perak; on Gunong Bubu; elevat. 5,000 feet, Wray.

8. *POLYALTHIA KUNTLERI*, King n. sp. A shrub or small tree; young branches puberulous, speedily glabrous. *Leaves* oblong-lanceolate rarely elliptic-lanceolate, shortly and rather bluntly acuminate, the base narrowed and sub-acute or rounded; upper surface glabrous, shining; the lower paler, dull, puberulous on the midrib and nerves; main nerves 6 to 12 pairs, rather prominent beneath, ascending, inter-arching ·1 to ·2 in. from the margin; length 4·5 to 8 in., breadth 1·5 to 2·35 in.; petiole ·2 in., pubescent. *Flowers* ·4 in. in diam., axillary or extra-axillary,

solitary or in pairs; peduncles .25 in. long, each with two rather large unequal, broadly ovate bracts above the base. *Sepals* broadly triangular-ovate, obtuse, nearly as long as the petals and, like them, minutely tomentose. *Petals* sub-equal, broadly oblong-ovate, obtuse. *Ovule* solitary. *Fruit* 2 in. in diam.; individual carpels numerous, ovoid-globular, apiculate, .3 in. long; stalks slender, .5 in. long, adpressed rufous-pubescent like the carpels. *Ellipeia parviflora*, Scortechini MSS.

Perak: King's Collector, Scortechini, Wray.

This much resembles *P. Jenkinsii* and *P. andamanica* in its leaves and fruit: but its flowers are totally different.

9. POLYALTHIA SCORTECHINII, n. sp. King. A small tree 15 to 20 feet high; young branches minutely rufous-tomentose, but speedily glabrous. *Leaves* thinly coriaceous, oblong or oblong-elliptic, acute or shortly acuminate, the base rounded or sub-acute; upper surface glabrous, shining, the midrib pubescent; the lower dull, very minutely dotted, the midrib and sometimes nerves puberulous; main nerves 8 to 11 pairs, bold and prominent on the lower surface, oblique, inter-arching close to the edge: length 4 to 8 in., breadth 1.15 to 2.25.; petiole .25 in., pubescent. *Flowers* pedicelled, solitary or in pairs, from the axils of leaves or of fallen leaves: pedicels .5 to .75 in. long, rufous-tomentose, with a rather large bract about the middle. *Sepals* small, triangular, pubescent. *Petals* fleshy, sub-equal, greenish-yellow changing into dark dull yellow, oblong-lanceolate or oblong-oblancoolate, acute or rather blunt, the edges wavy, both surfaces minutely pubescent, 1.5 to 2 in. long. *Ovaries* narrowly elongate-adpressed, pubescent, each crowned by large fleshy glabrous stigma. *Ovule* solitary, basal. *Fruit* shortly stalked; ripe carpels numerous pedicelled, ovoid, crowned by the remains of the stigma, sparsely pubescent, .3 in. long; pedicel slender, pubescent, .75 in. long. *Seed* with pale smooth testa. *P. Jenkinsii*, H. f. and T. (*in part*). *Ellipeia undulata*, Scortechini MSS.

Malacca: Griffith, No. 413. Perak, King's Collector, Scortechini. Distrib. :—Sumatra, Beccari, Nos. 935, 976.

10. POLYALTHIA JENKINSII, Benth. and Hook. fil. Gen. Pl. I, 25. A tree: young shoots sparsely rufous-pubescent. *Leaves* membranous, oblong-lanceolate to elliptic-ovate, acute or shortly acuminate, slightly narrowed to the acute or rounded sub-oblique base; both surfaces glabrous, minutely reticulate, the upper shining and the midrib puberulous; main nerves about 7 pairs, slender, slightly prominent beneath, inter-arching at some distance from the edge: length 4 to 7 in., breadth 1.35 to 3 in., petiole .2 to .3 in. *Flowers* large (1.75 to 3 in. in diam.), pedicelled, solitary, rarely in pairs, axillary: pedicels .6 to .75 in. long, pubescent, and with several small rounded bracts near the base. *Sepals*

very small, sub-orbicular, puberulous. *Petals* sub-coriaceous, spreading, greenish changing to yellow, broadly lanceolate or oblanceolate, sub-acute or obtuse, the base much narrowed, puberulous or glabrous. *Ripe carpels* numerous, stalked, oblong, slightly apiculate, glabrous, .4 in. long: stalk slender, .6 in. long. *Seed* smooth. Hook. fil. Fl. Br. Ind. Ind. I, 64 (*in part*); Kurz For. Fl. Burm. I, 375 (*in part*); *Gutteria Jenkinsii*, Hook. fil. and Thoms. Fl. Ind. 141; Miq. Fl. Ind. Bat. I, pt. 2, p. 46. *Gutteria Parveana* Miq. Fl. Ind. Bat. Vol. I, Pt. 2, p. 48, and Suppl. 378. *Uvaria canangioides*, Reichb. fil. et Zoll. MSS. *Monoon canangioides*. Miq. Ann. Mus. Lugd. Bat. II, 18.

Malacca; Griffith; Maingay, No. 46 (and 45 *in part*) (Kew Distrib.). Perak; King's Collector, No. 3910. Assam and Silhet.

Specimens from Perak have larger flowers than those from Assam; but otherwise they agree fairly well, and both appear to be specifically identical with the Sumatra plant named *Gutteria* or *Monoon canangioides* by Miquel. The Andaman plant which Kurz originally (Andam. Report (1870) p. 29) named *Polyalthia andamanica*, but which Sir Joseph Hooker (dealing with imperfect materials) reduced (with Kurz's assent) to this species, I have restored to specific rank. Recently received specimens show its flowers to be different from those of true *P. Jenkinsii* (the petals being shorter and narrower), while the carpels are larger.

11. *POLYALTHIA HOOKERIANA*, King n. sp. A tree 20 to 70 feet high: young branches softly tawny-pubescent, ultimately glabrous and darkly cinereous. *Leaves* membranous, obovate-elliptic or oblanceolate, shortly acuminate, narrowed from above the middle to the sub-cuneate base; both surfaces reticulate, the upper glabrous except the pubescent midrib and nerves: lower glabrous, the midrib and nerves adpressed-pubescent: main nerves 10 or 11 pairs, oblique, forming imperfect arches close to the edge, prominent beneath; length 5 to 7 in., breadth 2.25 to 3.25 in.; petiole .15 to .2 in., tomentose. *Flowers* in pairs from peduncles with several aborted flowers near their bases, extra-axillary: pedicels .5 to .75 in. long, lengthening in fruit, stout, pubescent, with 1 or 2 small ovate bracteoles at the middle or below it. *Sepals* broadly ovate, concave, free or connate only at the base, pubescent outside, glabrous within, .2 in. long. *Petals* coriaceous, yellowish, subequal, ovate or obovate-oblong, sub-acute, puberulous except at the base inside, only slightly contracted at the base, nearly 1 in. long. *Stamens* numerous, very short, cuneate; the apical process of the connective thick with a truncate orbicular top hiding the linear dorsal anthers. *Ovaries* short, oblong, puberulous, with 1 ovule: stigma sessile, large, obovate with sub-truncate lobed apex. *Ripe carpels* numerous, ovoid, slightly apicu-

late at the top and somewhat narrowed at the base, .65 in. long, stalks 1.2 in. long. *Seed* solitary, ovoid, smooth, with a vertical furrow.

Malacca: Maingay (Kew Distrib.). No. 96. Perak; King's Collector; Wray.

This is a common tree in Perak. In Malacca, however, it appears to be rare; for it is so very imperfectly represented in Maingay's great Malayan collection (of which the best set is at Kew), that Sir Joseph Hooker, while recognising it as a *Polyalthia*, had not sufficient material to enable him to describe it in his *Flora of British India*.

12. *POLYALTHIA SIMIARUM*, Benth. and Hook. fil. Gen. Pl. I, 25; Hook. fil. Fl. Br. Ind. I, 63. A tree 50 to 80 feet high; all parts glabrous except the puberulous leaf buds, under surface of nerves of leaves and inflorescence; young branches pale brown, striate, sparsely lenticellate. *Leaves* sub-coriaceous, ovate-oblong to oblong-lanceolate, acute or shortly acuminate, the base rounded or sub-acute; upper surface shining; lower dull, sometimes puberulous on the midrib and nerves; main nerves 12 to 16 pairs, oblique, prominent beneath; length 5 to 11 in., breadth 2 to 4.5 in., petiole .25 in. *Flowers* pedicelled, in few-flowered sessile fascicles from the axils of fallen leaves or from tubercles on the larger branches: pedicels minutely pubescent, with a small bract below the middle, 1 to 1.25 in. long. *Sepals* small, bluntly triangular, recurved, pubescent outside. *Petals* spreading, linear, sub-acute or acute, greenish-yellow to purplish, puberulous outside, glabrous inside, 1 to 1.25 in. long, the inner rather the longer. *Ripe carpels* stalked, ovoid-elliptic, slightly mammillate, contracted towards the base, glabrous and orange-red to bluish-black when ripe, 1.25 to 1.5 in. long: stalk from 1 to 1.75 in. *Seed* ovoid, grooved, transversely striate. Kurz For. Fl. Burm. I, 37; Hook. fil. Fl. Br. Ind. I, 63. *Gutteria simiarum*, Ham., Wall. Cat. 6440; Hook. fil. and Thoms. Fl. Ind. 142. *G. fasciculata*, Wall. MSS. ex Voigt Hort. Sub. Calc. 16. *Polyalthia lateriflora*, Kurz (not of King), Journ. As. Soc. Beng., Pt. 2, (for 1874) 52. *Unona simiarum*, H. Bn., Pierre Fl. Forest. Coch-Chine, t. 23.

Andamans, Bot. Garden Collectors. Perak, King's Collector. Forests at the base of the Eastern Himalaya, the Assam range, Chittagong, Burmah.

Var. *parvifolia*, King: leaves smaller than in typical form (3.5 to 6 in. long and 1.25 to 2.25 in. broad) puberulous beneath.

Perak; at elevation of 3,000 to 4,000 feet. Distrib. Sumatra: on Goenong Trang, Lampongs. (Forbes, No. 1536).

13. *POLYALTHIA LATERIFLORA*, King. A tree 50 to 70 feet high: young branches lenticellate and striate; all parts except the inflorescence quite glabrous. *Leaves* coriaceous, oblong to elliptic-oblong

abruptly acute or shortly acuminate, slightly narrowed to the rounded rarely sub-cordate and unequal base: upper surface shining, the lower paler, rather dull: main nerves 12 to 16 pairs, rather prominent, oblique spreading, evanescent at the tips: length 8 to 15 in., breadth 2.5 to 7 in.; petiole .3 in. stout. *Flowers* in fascicles from tubercles on the stem and larger branches, pedicelled, 1.25 to 2 in. long; pedicels slender, thickened upwards, pubescent, with 2 bracteoles about the middle, 1.25 to 1.75 in. long. *Sepals* coriaceous, ovate-orbicular, very short, densely and minutely tomentose outside. *Petals* coriaceous, greenish-yellow, dull crimson at the base, oblong-lanceolate, gradually tapering to the sub-acute apex, the outer rather shorter than the inner, minutely pubescent especially on the outer surface. *Ripe carpels* ovoid-elliptic, blunt, slightly narrowed to the base, glabrous, 1.25 in. long and .7 in. in diam.; the pericarp thin, fleshy: the stalks stout, glabrous, sub-asperulous, 1.25 to 2 in. long. *Gutteria lateriflora*, Bl. Bijdr. 20: Fl. Jav. p. 100, t. 50 and 52 D.: Miq. Fl. Ind. Bat. I, pt. 2 p. 47. *Monoon lateriflorum*, Miq. Ann. Mus. Lugd. Bat. II, 19.

Perak; at low elevations, Wray, King's Collector. Distrib: Java.

This is closely allied to *P. simiarum*, Benth. and Hook. fil.: but has smaller flowers which are often borne on the smaller branches; smaller leaves; and shorter stalked carpels. Moreover the leaves and young branches of this are invariably glabrous. The leaves of old trees are very markedly smaller than those on young specimens. Specimens in young fruit of a plant which may belong to this species have been recently received from the Andamans from the Collectors of the Bot-Garden, Calcutta: but, until the receipt of fuller material, I hesitate to include these islands in the geographical area of the species.

14. *POLYALTHIA SCLEROPHYLLA*, Hook. fil. and Thoms. Fl. Br. Ind. I, 65. A glabrous tree: young branches pale. *Leaves* coriaceous, oblong, ovate or linear-oblong, acute or obtusely acuminate, the base broadly cuneate, shining on both surfaces and with the reticulations distinct; main nerves about 10 to 12 pairs, spreading, slender: length 6 to 8 in.: breadth 1.5 to 2.6 in., petiole .5 in. *Flowers* pedunculate, in fascicles from small tubercles on the trunk, 2 in. in diam, greenish: tubercles .5 to 1 in. in diam.: peduncles 1 to 1.5 in. long, stout, rusty-pubescent, becoming glabrous; bracts small, orbicular, from about the middle of the peduncle. *Sepals* ovate, obtuse, short. *Petals* linear-oblong, obtuse, the base slightly concave, puberulous on both surfaces, 1.6 in. long, the inner rather smaller. *Torus* broad, flat, the edge raised. *Ovaries* pilose, shorter than the cylindrical style. *Ripe carpels* elliptic-oblong, slightly narrowed at either end, 1 to 1.5 in. long, glabrous, the pericarp thin: stalks 1 to 1.5 in. long. *Seed* oblong, the testa shining, pale.

Malacca; Maingay (Kew Destrib), No. 101.

I have seen only Maingay's Malacca specimens of this plant.

15. *POLYALTHIA MACROPODA*, King n. sp. A tree 50 to 60 feet high; young branches rather pale, pubescent but speedily glabrous. *Leaves* membranous, oblong-lanceolate, shortly acuminate, the base acute; the edge slightly revolute; upper surface shining, glabrous except the puberulous sulcate midrib; the lower paler when dry, minutely lepidote, sparsely strigose on the midrib and 8 or 9 pairs of curving rather prominent nerves; length 3·5 to 5·5 in., breadth 1·4 to 2·1 in., petiole ·25 in. *Flowers* nearly 1 in. long, in fascicles on short broad rugose woody tubercles from the stem close to its base: pedicels about 1 in. long, woody in fruit and 2 in. or more in length, glabrous; bracteoles (if any) deciduous. *Sepals* broadly ovate, acute, spreading, corrugated and glabrescent outside, glabrous inside, connate at the base to form a cup ·65 in. in diam. *Petals* elliptic, blunt, slightly constricted about the middle, sub-equal, puberulous, coriaceous. *Stamens* numerous, compressed especially the outer rows; apical process of connective transversely elongated, truncate. *Ovaries* numerous, oblong-ovoid. *Ripe fruit* with large woody sub-globular torus 1·25 in. in diam.; *ripe carpels* numerous, oblong-ovoid, tapering to the apex, the base gradually narrowed into a stalk, 2·5 to 3·5 in. long (including the stalk); pericarp rather fleshy, glabrous. *Seed* solitary, elongated-ovoid, grooved vertically.

Perak: King's Collector, Singapore, Ridley.

A species remarkable for its large ripe carpels borne on the stem near the ground. It is possible that Mr. Ridley's plant, collected in Singapore, may really belong to a distinct species, the only specimen of it which I have seen being very imperfect. This comes very near *P. clavigera* King.

16. *POLYALTHIA CLAVIGERA*, King n. sp. A tree 30 to 40 feet high; young branches slender, at first puberulous but speedily glabrous and pale. *Leaves* thinly coriaceous, oblong, tapering to each end, acuminate; both surfaces reticulate; the upper shining, glabrous except the puberulous sulcate midrib; lower surface slightly puberulous at first but ultimately quite glabrous: main nerves 7 pairs, ascending, curved, not inter-arching, slightly prominent beneath, obsolete above; length 5·5 to 8·5 in., breadth 1·75 to 2·5 in.; petiole ·4 in. slightly winged above. *Flowers* unknown. Peduncle of ripe fruit stout, woody, 2 in. or more in length; the torus depressed-globular, woody, about ·5 in. in diam.: *ripe carpels* ovoid-elliptic, tapering to each end, the base gradually passing into the stout puberulous slightly scabrid stalk, greenish-yellow when dry, glabrous: the pericarp succulent; length 2·25 in., breadth nearly 1 in.; stalk 1·5 in. puberulous; seed solitary, ovoid.

Penang: Pinara Bukit, elevat. 2000 feet. Curtis (No. 2444).
Perak: Waterfall Hill, Wray. Distrib. E. Sumatra, Forbes (No. 1638).

This species is known only by a few fruiting specimens collected by Messrs. Curtis and Wray Junior. It is nearly allied to *P. macropoda*, King; but its leaves have different venation and texture, the torus of the ripe fruit is smaller, while the carpels themselves are larger and have longer stalks.

17. *POLYALTHIA GLOMERATA*, King n. sp. A tree 40 to 50 feet high: young branches glabrous, pale, rather slender. *Leaves* membranous, elliptic to oblong, slightly oblique, acute or shortly acuminate, the base slightly cuneate or rounded; both surfaces reticulate, glabrous; the midrib alone puberulous on the upper, adpressed-puberulous on the lower; main nerves 7 to 8 pairs, curved, ascending, not inter-arching, thin but slightly prominent beneath; length 4 to 6 in., breadth 1·8 to 2·6 in., petiole ·25 to ·35 in. *Flowers* about 1 in. long, in clusters of 20 to 30 from nodulated puberulous tubercles on the stem; pedicels long (1·5 to 2·5 in.), slender, puberulous, with an ovate-lanceolate bracteole about the middle. *Sepals* thick, lanceolate-acuminate with broad connate bases, sub-erect, puberulous. *Petals* coriaceous, sub-erect, linear-oblong, slightly concave and glabrous at the base inside, otherwise minutely tomentose, the inner slightly smaller than the outer. *Stamens* numerous; the connective with an orbicular sub-convex apical expansion concealing the linear dorsal anther-cells. *Ovaries* much less numerous than the stamens, oblong, hirsute, apparently 1-ovuled; the stigma small, oblong, slightly pubescent.

Perak; King's Collector, Wray. Distrib. Sumatra; Forbes, No. 2804.

In all the flowers I have examined the pistils are very small (as if undeveloped) and I have not been able to find more than one ovule. In the Sumatran specimens the flowers are much longer than in those from Perak.

18. *POLYALTHIA CONGREGATA*, King n. sp. A tree 40 to 60 feet high; young branches at first rusty-puberulous but speedily glabrous and dark-coloured. *Leaves* thinly coriaceous, oblong-elliptic, acute, slightly narrowed to the rounded or minutely cordate base; upper surface glabrous except the depressed puberulous midrib; the lower pale when dry, glabrous, minutely lepidote; main nerves 13 to 19 pairs, oblique, curving, thin but prominent beneath; length 9 to 16 in., breadth 3·75 to 7 in.; petiole ·3 or ·4 in. stout. *Flowers* large, in short, much divided, rough, tubercular, woody cymes from the stem near its base; the pedicels 1·25 to 1·75 in. long, glabrescent; bracteole single, sub-orbicular, clasping, infra-median. *Sepals* thick, broadly ovate-triangular,

spreading, slightly euncate at the base, concave, corrugated and puberulous outside, glabrous inside, often reflexed, .5 in. long. *Petals* thick, white, ovate-elliptic, sub-acute, hoary-puberulous except at the base inside on both surfaces; the outer row 1.5 to 3 in. long and .65 to 1 in. broad, the inner row narrower. *Stamens* numerous, compressed; the apical process of the connective truncate, oblique, granular; anther-cells linear, dorsal. *Ovaries* 20 to 30, oblong, strigose, with a single basilar ovule; stigma oblong, pubescent. *Ripe carpels* elliptic, beaked, 1 in. or more long, hoary-pubescent, narrowed at the base into the short, thick stalk. *Seed* solitary, pale brown, shining, elliptic.

Perak; Seorteehini, King's Collector.

This resembles *P. macrantha*, King; but is distinguished from it by its cymose, cauline inflorescence, smaller flowers and puberulous fruit. H. O. Forbes collected in the Lampongs in Eastern Sumatra a plant (No. 1642 of his Herb.) which greatly resembles this.

19. *POLYALTHIA HYPOGAEA*, King, n. sp. A tree 25 to 30 feet high; young branches rather stout, densely but minutely rufous-tomentose, ultimately rather pale, striate. *Leaves* large, thinly coriaceous, oblong or elliptic-oblong, sometimes slightly obovate, gradually narrowed to the rounded base; both surfaces glabrous when adult, the lower puberulous when young, the veins transverse and, (like the reticulations), distinct; main nerves 18 to 22 pairs, oblique, inter-arching within the edge, thin, prominent on the lower and depressed on the upper surface when dry; length 10 to 20 in., breadth 3 to 7 in.; petiole .4 in., stout, tomentose. *Flowering branches* from the stem near its base, 1 to 8 feet long, flexuose, rufous-pubescent like the lanceolate bracteoles. *Flowers* .75 to 1 in. long, cream-coloured; pedicels .75 to 1.5 in. long, usually with one lanceolate, tomentose bracteole near the middle and a second, sub-orbicular and acuminate, close to the flower. *Sepals* broadly triangular-ovate, acute, spreading, tomentose outside, glabrous inside, .25 in. long. *Petals* coriaceous, the inner row rather smaller than the outer, narrowly oblong, sub-acute, pubescent outside except the glabrescent base and edges, inside almost glabrous. *Stamens* numerous, short, compressed; apical process of connective broad, slightly convex, slightly oblique, sub-granular, deeply ridged in front, the anther-cells linear dorsal. *Ovaries* few, oblong, villous, 1-ovuled; stigma large, ovoid, granular, sessile. *Immature carpels* narrowly ovoid, sub-compressed, the apex beaked, the base slightly contracted, minutely tomentose. *Seed* solitary, elongated, ovoid, smooth.

Perak; near Laroot, King's Collector. Gmngong Batu Puteh; elev. 3,400 feet, Wray.

A species remarkable for its hypogoeal inflorescence. The flower-

ing branches, which vary from 1 to 8 feet in length, originate from the stem near its base, pass into the soil underneath the surface of which they run for some distance, and bear on their emerging tips the flowers and fruit

20. *POLYALTHIA OBLIQUA*, Hook. fil. and Thoms. Fl. Ind. 138. A tree: young branches minutely pubescent, lenticellate. *Leaves* subsessile, oblong-lanceolate, acute or shortly acuminate, the base cuneate, minutely and obliquely cordate; shining and glabrous on both surfaces, the lower pale; main nerves 7 or 8 pairs, slender, curving and forming bold arches .15 in. from the margin; length 4 to 6.5 in., breadth 1.5 to 2.2 in.; petiole .1 in., very stout. *Flowers* .4 to 5.4 in. in diam., solitary, pedicellate, extra-axillary; each pedicel rising from a short conical woody tubercle, curving, .25 in. long. *Sepals* coriaceous, broadly triangular, blunt, less than half as long as the petals, pubescent. *Petals* coriaceous, sub-equal, oblong, obtuse, sericeous outside. *Ripe carpels* pisiform, with stalks .5 in. long, dark brown. Hook. fil. Fl. Br. Ind. I, 67; Miq. Fl. Ind. Bat. I, Pt. 2, p. 44.

Malacca; Griffith, Maingay, No. 44 (Kew distrib.). Chittagong Hill Tracts; Lister. Distrib. Sumatra.

Lister's plant from the Chittagong Hill Tracts agrees well with Griffith's specimens from Malacca.

21. *POLYALTHIA ABERRANS*, Maing. ex Hook. fil. Fl. Br. Ind. I, 67. A large climber, glabrous except the flowers and fruit: young branches slender, black. *Leaves* membranous, oblong-lanceolate, acuminate, the base slightly cuneate; both surfaces reticulate, glabrous, the lower glaucous; main nerves 14 to 18 pairs, very faint, the secondary nerves quite as well marked: length 3.5 to 5 in., breadth 1.4 to 1.8 in., petiole .2 to .25 in. *Flowers* .5 to .75 in. in diam., solitary, axillary; pedicels slender, 1.25 in. long (longer in fruit), with one minute bracteole below the middle and another at the base. *Sepals* ovate-orbicular, sub-acute, quite connate into a 3-angled glabrous cup .25 in. in diam. *Petals* leathery, ovate-orbicular, sub-acute, spreading, concave; the outer row .35 in. long and .3 in. broad, yellowish-pubescent on both surfaces except a glabrous patch near the base on the inner: inner petals half the size of the outer but more concave, hoary-puberulous outside, glabrescent inside. *Stamens* numerous; apical process of connective broad, discoid, depressed in the centre, quite concealing the long linear lateral anther-cells. *Ovaries* narrowly oblong, glabrous, 1 or 2-ovuled: style as long as the ovary, curved: stigma small. *Ripe carpels* ovoid, slightly apiculate, puberulous or glabrescent, .35 in. long and .3 in. in diam.; stalks .7 to .8 in., slender, glabrous. *Seeds* solitary, rarely 2, ovoid, shining, smooth. *Melodorum glaucum*, Scortechini MSS.

Malacca : Maingay. Perak ; Scortechini, Wray.

In some carpels there are two seeds, such carpels being about twice as long as those with a single seed. Although referred by the late lamented Father Scortechini to the genus *Melodorum*, this is an undoubted *Polyalthia* in its stamens, in its 1- rarely 2-ovuled ovaries, and in its carpels with usually solitary, ovoid seeds. In externals, save and except the much smaller size of the flowers, this much resembles the plant figured by Pierre under the name of *Unona Mesnyi* (Flore Forest. Coch-Chine, t. 17) to which indeed Pierre reduces *P. aberrans*.

22. *POLYALTHIA BULLATA*, King n. sp. A shrub 6 to 8 feet high : young branches densely covered with long soft spreading golden hairs. *Leaves* thinly coriaceous, bullate (at least when dry), narrowly oblong, acuminate, narrowed but slightly to the deeply cordate auricled base : both surfaces boldly reticulate, the upper shining, glabrous except the sulcate puberulous midrib ; the lower glabrescent except the midrib and nerves which have sparse hairs like those on the young branches : main nerves 25 to 40 pairs, spreading towards the base, sub-ascending towards the apex, forming a double series of arches within the margin, bold and prominent on the lower, depressed on the upper, surface : secondary nerves and reticulations prominent ; length 12 to 14 in., breadth 2.75 to 3.35 in. ; petiole .25 in., pubescent like the young branches. *Flowers* solitary, terminal or axillary, 1 in. long ; pedicels slender, 1 in. long, pubescent, bracteole small, mesial. *Sepals* small, lanceolate, spreading, free, sparsely pubescent outside, glabrescent inside, about .25 in. long. *Petals* narrowly linear, slightly wider at the base, subequal, sub-concave, sparsely pubescent. *Stamens* numerous, the apical process of the connective sub-convex, orbicular, slightly granular. *Ovaries* much fewer than the stamens, oblong, pubescent ; the stigma sub-capitate-truncate, puberulous. *Ripe carpels* globular-ovoid, blunt at each end, puberulous, .4 in. long ; stalks slender, .2 in. long. *Seeds* 2, plano-convex, the testa rugose, pale : the albumen horny.

Singapore : Ridley. Perak ; King's Collector.

Evidently a rare shrub ; readily recognisable by its elongate very bullate leaves.

23. *POLYALTHIA SUB-CORDATA*, Blume Fl. Javae, 71 t. 33 and 36 B. A shrub or small tree : young branches sparsely hispid-pubescent, afterwards glabrous and furrowed, not pale. *Leaves* membranous, sub-sessile, oblanceolate-oblong or elliptic-oblong, shortly and obtusely caudate-acuminate ; the base slightly narrowed, sub-cordate, auriculate at one side ; both surfaces glabrous except the sometimes puberulous midrib : main nerves 9 to 12 pairs, slender, the reticulations lax and faint : length 4.5 to 9 in., breadth 1.6 to 3 in. ; petiole .05 in., pubescent. *Flowers*

about 1 in. in diam., solitary, axillary or extra-axillary; peduncles slender, .5 to .75 in. long, puberulous and with 1 or 2 lanceolate bracteoles. *Sepals* ovate, sub-acute; united into a cup. *Petals* coriaceous, yellowish, oblong, sub-acute, the inner rather smaller, slightly pubescent outside. *Carpels* numerous, broadly ovoid, not apiculate, furrowed, glabrous, .4 in. long; stalks slender, .25 in. long; pericarp thin. Miq. Fl. Ind. Bat. I, Pt. 2, p. 44; Ann. Mus. Ludg. Bat. II, 14. *Unona subcordata*, Bl. Bijdr. 15.

Perak; elev. about 800 feet, King's Collector, No. 2373. Distrib. Java.

24. *POLYALTHIA OBLONGA*, King, n. sp. A shrub or small tree 10 to 15 feet high: young branches at first rufous-tomentose, afterwards glabrous, pale and furrowed. *Leaves* thinly coriaceous, sub-sessile, oblong or oblong-oblancoate, abruptly and shortly acuminate, narrowed to the minutely cordate, unequal base; upper surface glabrous, except the pubescent midrib; lower puberulous, the midrib prominent as are the 14 to 20 pairs of little curving, sub-ascending, main nerves; reticulations open and distinct; length 9 to 14 in., breadth 3.5 to 5 in.; petiole .15 in., tomentose. *Flowers* 1.25 to 1.75 in. in diam., solitary, axillary or extra-axillary, from small tubercles: pedicels 1.25 to 2.5 in. long, puberulous and with 2 lanceolate bracteoles near the base. *Sepals* semi-orbicular, acute, very short, united into a cup, pubescent outside. *Petals* coriaceous, yellow, subequal, oblong, tapering to the sub-acute apex, minutely adpressed-pubescent on both surfaces but especially on the outer, length .75 to 1.15 in. *Ripe carpels* 10 to 20, ovoid to orbicular, apiculate, .3 to .35 in. long, pubescent or sub-glabrous; stalks slender, .6 to .75 in. long. *Seeds* usually solitary and ovoid, or sometimes two and plano-convex.

Perak: very common at elevations of from 1,000 to 2,500 feet.

This plant closely resembles *Guatteria* (= *Polyalthia*) *elliptica* Blume: but its leaves have more numerous nerves and its carpels are stalked, those of *P. elliptica* (according both to Blume's description and figure) being sessile and of larger size.

25. *POLYALTHIA BECCARII*, King n. sp. A tree 15 to 40 feet high: young branches slender, rufous-tomentose; the older coarsely striate and lenticellate. *Leaves* thickly membranous, narrowly oblong or oblong-lanceolate, acuminate, slightly narrowed to the rounded base; both surfaces shining and reticulate, the midrib pubescent on the upper tomentose on the lower; main nerves 6 or 7 pairs, slender, spreading, forming bold arches far from the edge, the secondary nerves distinct; length 3 to 4.5 in., breadth .75 to 1.35 in.; petiole .1 in., tomentose. *Flowers* 1 in. long, in fascicles from bracteolate tubercles on the older

branches, their pedicels slender, pubescent, minutely bracteolate near the base, about 1 in. long. *Sepals* ovate-obtuse, .15 in. long, pubescent outside. *Petals* coriaceous, dark-yellow, sub-equal, linear-oblong, sub-acute, 1 in. to 1.5 in. long and from .1 to .2 in. broad, minutely pubescent especially outside. *Ovaries* pubescent, 2-ovuled. *Ripe carpels* numerous, broadly ovoid, apiculate, glabrous, sub-granular when ripe, .35 in. long; their stalks granular, puberulous, .6 to .75 in. long.

Perak: at low elevations. Scortechini, King's Collector, Wray. Distrib. Sumatra; Beccari P. S., No. 401. Borneo; Motley No. 743.

The leaves of this species, although smaller, have much the same venation as those of *P. Teysmannii*, King. The carpels of this are, however, very much smaller than those of *P. Teysmannii*.

26. POLYALTHIA CINNAMOMEA, Hook. fil. and Thoms. Fl. Ind. 138; Hook fil. Fl. Br. Ind. I, 65. A tree 50 to 70 feet high; young branches rusty-tomentose. *Leaves* thinly coriaceous, narrowly oblong to oblanceolate, tapering to each end, acute or shortly acuminate, the base rounded; upper surface glabrous, shining; the lower sparsely lucid-pubescent, (glabrescent when old), the midrib tomentose; main nerves about 12 or 14 pairs, slender, curved, ascending, inter-arching freely; length 4.5 to 7.5 in., breadth 1.25 to 2.25 in.; petiole .2 in., tomentose. *Flowers* sub-sessile, solitary, or in pairs from short woody tubercles from the young branches below the leaves, dull red, 2 to 2.25 in. long; peduncles very short, rusty-tomentose, bracteolate at the base. *Sepals* spreading, sub-orbicular, .25 in. long, tomentose. *Petals* sub-equal, thick, linear-oblong, sub-acute, slightly narrowed at the base, adpressed-pubescent externally, glabrous within, 2 to 3 in. long. *Anthers* numerous, short, compressed; connective with broad, flat, apical, truncate process. *Pistils* oblong, pubescent; stigma large, sub-truncate. *Torus* convex, tomentose. *Fruit* globose, 2.5 in. in diam.; the individual carpels pyriform with very short stalks, .75 to 1 in. long and .5 to .75 in. in diam., densely rusty-tomentose; pericarp thick. *Seeds* 2, plano-convex, with scaly testa, Miq. Fl. Ind. Bat. I, Pt. 2, p. 44. *Guatteria cinnamomea*, Wall. Cat. 6444. *G. multinervis*, Wall. Cat. 6445. *Unona cauliflora*, H. f. and Th. Fl. Ind., 137; Fl. Br. Ind. 2, 60. Miq. Fl. Ind. Bat. I, Pt. 2, 43.

Singapore; Wallich, Ridley. Penang; Wallich, Curtis No. 2470. Malacca, Maingay (Kew Distrib.) No. 37.

Apparently not a common species. Maingay's specimens from Malacca have rather larger and smoother leaves than those from Singapore and Penang.

27. POLYALTHIA PACHYPHYLLA, King, n. sp. A tree 50 to 100 feet high; young branches softly pubescent, afterwards glabrous and furrowed. *Leaves* rigidly coriaceous, elliptic-oblong, sub-acute; the edge

slightly recurved, the base broad and rounded, or narrowed and sub-acute; both surfaces glabrous; the lower slightly paler, the midrib tomentose at the base beneath; main nerves 11 or 12 pairs, spreading, prominent, evanescent at the tips; length 4·5 to 7·5 in., breadth 1·75 to 3·5 in., petiole ·35 to ·5 in., tomentose when young. *Flowers* about 1·5 in. long, in few-flowered fascicles from small tubercles on the older branches; their pedicels 2 in. long, bracteolate about the middle, softly tawny-tomentose. *Sepals* broadly half-orbicular, very short, reflexed, tomentose. *Petals* coriaceous, nerved, pale green, oblong-lanceolate or oblanceolate, sub-acute or obtuse, pubescent on the outer, tomentose on the inner, surface; the outer slightly shorter and narrower than the inner, from ·9 to 1·5 in. long and ·3 to ·5 in. broad. *Stamens* numerous, compressed, the apical process of connective truncate; anthers linear, dorsal. *Ovaries* numerous, glabrous, vertically striate; stigma sessile, truncate, puberulous. *Ripe carpels* numerous, crowded when young, densely covered with minute pale tomentum; when ripe narrowly obovoid, blunt, narrowed to a short stalk, sub-tomentose, 1·75 in. long and about 1 in. in diam.; pericarp thick, fleshy; seeds two, plano-convex.

In its leaves this resembles *Guatteria pondok*, Miq. (Fl. Ind. Bat. Suppl. 380), but that species has carpels with stalks from 2 to 3 in. long.

Perak; at elevation under 1,000 feet, King's Collector, Nos. 6655 and 7516.

28. *POLYALTHIA PYCNANTHA*, King. A tree? Young branches rather stout, covered with soft yellowish pubescence. *Leaves* coriaceous, elliptic-oblong, or oblong-lanceolate, obtusely acuminate, the base obtuse or rounded: upper surface glabrous; lower paler and puberulous on the midrib; main nerves arching, prominent; length 6 to 9 in., breadth 2·5 to 3·5 in.; petiole ·2 in., pubescent. *Flowers* ·5 to ·75 in. in diam., in fascicles from tubercles on the larger branches, 1 to ·5 in. in diam.; flower-peduncles ·25 in. long, pubescent, ebracteate. *Sepals* ovate, acute, ·2 in. long. *Petals* linear, obtuse, flat, sub-equal, the bases of the inner three concave, ·5 to ·75 in. long, pale sericeous outside, glabrescent inside. *Torus* columnar-flat-topped, glabrous: ovules 2, superposed. *Unona pycnantha*, Hook fil. in Fl. Br. Ind. I, 60.

Malacca; Maingay.

12. *ANAXAGOREA*, St. Hilaire.

Trees or shrubs. *Leaves* with pellucid dots. *Flowers* small, greenish, leaf-opposed. *Sepals* 3, valvate, connate at the base. *Petals* 6 or 3, sub-equal, 2-seriate, valvate, the inner row sometimes absent. *Torus* convex.

Stamens indefinite; anther-cells extrorse or sublateral; connective with a terminal process. *Ovaries* few, style variable; ovules 2, sub-basal, collateral, ascending. *Ripe carpels* follicular; stalk clavate. *Seeds* 1-2, exarillate, testa shining.—*Distrib.* Tropical Asia and America; species about 8.

Petals 6 1 *A. luzonensis*
 ,, 3 2 *A. Scortechinii*.

1. ANAXAGOREA LUZONENSIS, A. Gray Bot. U. S. Expl. Exped. 27. A shrub; all parts glabrous. *Leaves* membranous, oblong or elliptic-oblong, shortly acuminate, the base cuneate, the under surface pale; main nerves 7 or 8 pairs, spreading, slightly prominent beneath, the reticulations wide, rather distinct; length 5 to 7 in., breadth 1·75 to 2·5 in., petiole ·25 to 35 in. *Flowers* about 5 in. long, solitary; pedicels 25 in. long (twice as long in fruit), with 1 or 2 amplexicaul bracteoles. *Sepals* small, ovate-rotund, obtuse. *Petals* subequal, elliptic, obtuse, thin, nerved, white. *Ovaries* few. *Ripe carpels* 1 to 3, cuneate-clavate, somewhat compressed, narrowed into a long stalk, 1 to 2-seeded. *Seeds* plano-convex, obovate, black, shining. Hook. fil. Fl. Br. Ind. I, 68. Kurz F. Flora Burm. I, 39. *A. zeylanica*, H. f. and Th. Fl. Ind. 144: Thwaites Enum. 10; Miq. Fl. Ind. Bat. I, Pt. 2, 49; Beddome Ic. Pl. Ind. Or. t. 46. *Rhopalocarpus fruticosus*, Teysm. and Binn. in Miq. Ann. Mus. Lugd. Bat. II, 22 t. 2 fig. B. *Anaxagorea fruticosa*, Scheff. in Nat. Tijdsch. Ned. Ind. XXXI, 9.

Burma; The Andaman Islands; Malacca; Ceylon. *Distrib.* Philippines, Cambodia, Sumatra.

2. ANAXAGOREA SCORTECHINII, King, n. sp. A bush or small tree: all parts, except the flower, glabrous; the young branches sub-rugulose, 2-ridged. *Leaves* thinly coriaceous, elliptic-oblong or elliptic-obovate, shortly and abruptly acuminate, slightly narrowed to the rounded or sub-acute base; main nerves 7 to 9 pairs, rather prominent beneath, the reticulations open and distinct: length 6 to 8 in., breadth 2·5 to 3·5 in.; petiole ·3 to 4 in. *Flowers* 75 in. long, solitary; pedicels 3 in. (much longer in fruit) with 1 or 2 amplexicaul bracteoles. *Sepals* membranous, their edges thin, broadly ovate, acute, pubescent outside. *Petals* in a single row, much larger than the sepals, oblong-lanceolate, sub-acute, scurfy-pubescent outside, glabrous within, very fleshy, slightly concave at the base. *Stamens* numerous, those next the pistils barren; elongate and bent over the pistils. *Ovaries* numerous, obovoid, pubescent; styles curved. *Carpels* as in *A. luzonensis*, but two or three times as numerous. *Seeds* obovoid, concavo-convex, compressed, black, shining.

Perak: at low elevations; Scortechini, King's Collector, Wray.

I have altered the diagnosis of this genus as regards the petals to

admit this species in which the inner whorl of petals is absent. In other respects the species agrees perfectly with the original diagnosis. Teysmann and Binnindyk's mono-specific genus *Rhopalocarpus* (Miq. Ann. Mus. Lugd. Bat. II, 22, t. 2 fig. B.) is an unmistakable *Anaxagorea* in which the inner petals are narrow and incurved. It is probably near *A. luzonensis*. A. Gray, and *A. javanica*, Bl. (See Benth. and Hook fil. Gen. Plant. I, 957).

13. DISEPALUM, Hook. fil.

Trees or shrubs. *Sepals* 2, large, concave, valvate. *Petals* 4, narrowly linear-spathulate, incurved, inserted remotely from each other on the margin of the very broad, sub-concave torus. *Stamens* numerous; the apical process of the connective broadly orbicular, sub-convex. *Pistils* 10 to 15 or numerous, ovoid; style short, terete; stigma small, terminal; ovule solitary. *Leaves* minutely pellucid-punctate. *Flowers* in long terminal peduncles, solitary or in pairs. Distrib. Three species, all Malayan.

1. DISEPALUM LONGIPES, King, n. sp. A glabrous tree 30 to 40 feet high; young branches slender, pale brown. *Leaves* minutely pellucid-punctate, membranous, oblong, sometimes slightly oblanceolate, rarely oblong-elliptic, abruptly and shortly acuminate, the base cuneate; main nerves 7 to 10 pairs, spreading, (sub-horizontal) very faint; length 4 to 7 in., breadth 1.5 to 2.25 in., petiole .25 in. *Flowers* on long pedicels, dark red, solitary or in pairs. terminal, .5 in. in diam.; pedicels slender, ebracteolate, 1.25 to 2 in. long. *Sepals* reflexed, concave, broadly ovate, blunt. *Petals* remote from each other, linear-spathulate, sub-incurved, .2 in. long. *Stamens* numerous; apical process of the connective orbicular, sub-convex. *Ovaries* numerous, stalked, slightly obovoid, glabrescent or sparsely pubescent, 1-ovuled; style short, straight; stigma small, terminal. *Immature carpels* ovoid, sub-glabrous, slightly corrugated; pericarp fleshy, fragrant. *Seed* solitary, ovoid.

Johore; on Gunong Pauti at 1,500 feet; King's Collector, No. 231. Distrib. Borneo, Beccari (P. B. 1645).

The genus *Disepalum* was founded by Sir Joseph Hooker on a Bornean shrub collected by Lobb, and the only species known to its founder was that described and figured under the name of *D. anomalum* in the Linnæan Transactions (Vol. XXIII, 156, t. 20 A.) The characters which separate the genus from any other in the family are the dimerous symmetry of the sepals and petals, and the small size of the latter, which originate at some distance from each other from the edge of the broad sub-concave torus. The species here described differs from *D. anomalum* in its arboreous habit, larger leaves, and much more numerous

ovaries, which are moreover nearly glabrous and have long stalks. Quite ripe fruit is as yet unknown.

14. GONIOTHALAMUS, Blume.

Small trees or shrubs. *Leaves* with small nerves, forming intra-marginal loops. *Flowers* solitary or fascicled, axillary or extra-axillary; peduncles with basal, scaly, distichous bracts. *Sepals* 3, valvate. *Petals* 6, valvate in 2 series; outer thick, flat or nearly so; inner smaller, shortly clawed, cohering in a vaulted cap over the stamens and ovary. *Stamens* many, linear-oblong; anther-cells remote, dorsal; connective produced into an oblong or truncate process. *Ovaries* many; style simple or 2-fid; ovules solitary or 2, superposed, sub-basal (4 in *G. uvarioides*.) *Ripe carpels* 1-seeded.—*Distrib.* About 47 species, natives of Eastern tropical Asia and its islands.

The plants referred to this genus are, by Baillon, treated as part of *Melodorum*.

Ovules 1 or 2.

- | | |
|---|----------------------------|
| Style cylindric, slender; stigma subulate,
entire | 1. <i>G. subevenius</i> . |
| Style very short; stigma funnel-shaped, slit
on one side, its edges toothed ... | 2. <i>G. tenuifolius</i> . |
| Style cylindric; stigma truncate, entire.
Flowers in fascicles from the stem only;
ripe carpels 1.25 in. long ... | 3. <i>G. Prainianus</i> . |
| Flowers solitary from the axils of the
leaves or fallen leaves; ripe carpels .4
in. long | 4. <i>G. Kunstleri</i> . |
| Style subulate or cylindric; stigma deeply
2-cleft, petals 3 to 5 in. long ... | 5. <i>G. giganteus</i> . |
| Style cylindric; stigma unequally 2-toothed | 6. <i>G. malayanus</i> . |
| Style cylindric; stigma minutely and equally
2-toothed.
Flowers axillary or from the axils of
fallen leaves; outer petals more than
1 in. long.
Anthers with slightly convex, orbi-
cular apical appendages ... | 7. <i>G. fulvus</i> . |
| Anthers with very pointed, conical
apical appendages.
Nerves of leaves 28 to 34 pairs | 8. <i>G. Curtisii</i> . |
| Nerves of leaves fewer than
20 pairs. | |

- Leaves shining, reticulate,
glabrous; ripe carpels
oblong, '5 to '6 in. long 9. *G. Griffithii.*
- Leaves glabrous, opaque,
dull, not reticulate; ripe
carpels globular-obo-
void; '4 in. long. ... 10. *G. macrophyllus.*
- Flowers in fascicles from tubercles near
the base of the stem 11. *G. Ridleyi.*
- Style cylindric; stigma 3-toothed; apices
of anthers acuminate.
- Leaves thickly coriaceous; nerves in-
conspicuous 12. *G. Tapis.*
- Leaves strongly and prominently nerved.
- Sepals large, orbicular-ovate, ob-
tuse, '65 to 1 in. long ... 13. *G. Scortechinii.*
- Sepals small, ovate acuminate, '2
in. long 14. *G. Wrayi.*
- Ovules and seeds 4 15. *G. uvarioides.*

1. *GONIOTHALAMUS SUBEVENIUS*, King, n. sp. A shrub or small tree; young branches slender, puberulous; otherwise glabrous except the flower. *Leaves* membranous, narrowly oblong, tapering at each end; upper surface shining, pale-greenish when dry; the lower paler, dull; main nerves 10 to 12 pairs, sub-horizontal, invisible or very faint on either side; length 3·5 to 6·5 in., breadth 1·25 to 1·75 in., petiole '2 in. *Flowers* solitary, axillary, '75 to '9 in. long; pedicels '4 to '6 in. long, ebracteate. *Sepals* broadly ovate, bluntly acuminate, 3-nerved, minutely pubescent on both surfaces, '3 in. long. *Petals* thinly coriaceous, puberulous except towards the base inside, lanceolate, sub-acute; the inner petals half as large as the outer, slightly clawed. *Stamens* with broad orbicular sub-convex apical process. *Ovaries* narrowly oblong, style cylindric, curved; stigma subulate, entire. *Ripe carpels* ovoid to oblong, obtuse, tapering very little at the base, glabrous, '5 to '75 in.; stalks '35 to '45 in.

Perak; at low elevations, King's Collector.

2. *GONIOTHALAMUS TENUIFOLIUS*, King, n. sp. A shrub 6 to 8 feet high; glabrous except the petals; young branches slender, dark-coloured, striate. *Leaves* thinly membranous, lanceolate, or oblong-lanceolate, shortly acuminate, the base acute; main nerves 8 to 11 pairs, spreading, inter-arching within the minutely undulate margin, faint or both surfaces; length 4·5 to 7 in., breadth 1 to 1·75 in., petiole '2 in. *Flowers* axillary, solitary, drooping; pedicels slender, bi-bracteolate at the base,

·35 to ·45 in. long. *Sepals* free, large, membranous, green, many-nerved and reticulate, broadly ovate, acute or acuminate, glabrous, ·75 to 1·1 in. long. *Petals* whitish, thinly coriaceous, faintly nerved, broadly lanceolate, acuminate, much contracted at the base, pubescent, 1 to 1·2 in. long, (smaller in var. *aborescens*); inner petals less than half as long, ovate, acuminate, the base contracted, pubescent. *Anthers* numerous, compressed, the apices broad, flat, pubescent. *Ovaries* few, narrow, short, 1 rarely 2-ovuled; the style long, straight, thickened upwards; stigma hollowed like a funnel, the edges toothed. *Ripe carpels* partly enveloped by the persistent calyx, ovoid, very slightly apiculate, puberulous or glabrescent, ·4 to ·5 in. long; stalks ·2 in. long. *Seeds* usually 1, rarely 2.

Perak; at a low elevations, King's Collector, No. 3019; Wray, Nos. 3379, 3558.

Var. *aborescens*, King; a small tree 15 to 25 feet high; *leaves* 4 to 4·5 in. long; petals coriaceous, adpressed-pubescent, about half as long as in the typical form; *sepals* only ·3 in. long.

Perak; elevations from 2,000 to 3,000 feet, King's Collector.

This possibly ought to be considered a distinct species; but as its anthers and ovaries are exactly the same as in the typical shrubby *G. tenuifolius*, I prefer to consider it a mountain form of that species. Both the typical form and the variety have remarkable stigmas, shaped like funnels and with toothed edges.

3. GONIOTHALAMUS PRAINIUS, King, n. sp. A tree 50 to 70 feet high: young branches rather slender, pale; all parts, except the inflorescence, glabrous. *Leaves* membranous, oblong-oblong to elliptic-oblong, abruptly shortly and bluntly acuminate, the base slightly cuneate; main nerves 14 to 18 pairs, oblique, inter-arching within the margin, prominent beneath; length 7 to 11 in., breadth 2·25 to 2·8 in., petiole ·35 in. *Flowers* 1·25 to 1·5 in. in diam., on long pedicels from large, woody, puberulous tubercles at the base of the stem: pedicels 2 to 4 in. long with two minute bracteoles at the base. *Sepals* coriaceous, united so as to form a spreading cup with three broad sub-acute triangular teeth, puberulous outside, glabrous inside. *Petals* thickly coriaceous, pale yellow; the outer row large, obovate-rotund, concave, incurved, (ovate-oblong in var.) pubescent on both surfaces, nearly 1 in. long; inner row much smaller, clawed. *Stamens* numerous, the connective prolonged into a blunt, conical, puberulous, apical process. *Ovaries* narrowly oblong, glabrous; style cylindrical, not lobed, truncate. *Ripe carpels* obovoid, slightly apiculate, tapering to the base, glabrous, 1 to 1·25 in. long; stalks ·25 in. long. *Seed* solitary, smooth.

Perak; King's Collector, Wray; at low elevations.

Var.: *angustipetala*, King; petals oblong-ovate, sub-acute.

Perak : King's Collector.

A species collected by Forbes in Eastern Sumatra (Herb. Forbes, No. 3172) resembles this closely. The specimens are in fruit only, and the individual carpels being a little smaller and less obovoid, it probably belongs to a distinct species. Forbes' specimens have no flowers.

4. *GONIOTHALAMUS KUNSTLERI*, King. A shrub 4 to 10 feet high : young branches minutely rufous-tomentose, the older pale, glabrous and much striate. *Leaves* thinly membranous, oblanceolate to elliptic-oblanceolate, abruptly and bluntly acuminate, the base cuneate ; both surfaces pale-brown when dry, minutely pellucid-punctate, glabrous ; the midrib alone puberulous on the upper ; main nerves 11 to 13 pairs, spreading, curved and inter-arching boldly a little within the margin, slightly prominent on the under surface : length 6 to 9 in., breadth 2 to 3·25 in. ; petiole ·35 in. puberulous. *Flowers* solitary, slightly supra-axillary ; pedicels ·15 in. long. *Sepals* green, thinly membranous, puberulous, nerved and reticulate, broadly ovate, acute, spreading, very slightly cuneate at the base, ·3 to ·4 in. long. *Petals* sub-coriaceous, yellow or orange-coloured ; the outer lanceolate, acuminate, slightly narrowed at the base, puberulous outside, ·8 to 1·25 in. long : inner petals about one-third as long, ovate, acute, pubescent. *Anthers* many, short, compressed, the tops broad, flat, pubescent. *Ovaries* about as long as the stamens, narrowly cylindrical ; style long, straight, thick : stigma notched. *Ripe carpels* crowded, broadly ovoid, slightly apiculate, ·4 in. long.

Perak ; at Goping, King's Collector, Scortechini, Wray.

Var. *marcantha*, King ; leaves narrowly elliptic or oblong, bluntly acuminate, puberulous beneath ; outer petals 1·25 to 1·5 in. long.

Penang and Province Wellesley : Curtis.

5. *GONIOTHALAMUS GIGANTEUS*, Hook. fil. and Thoms. Fl. Ind., 109. A tree 30 to 70 feet high ; young branches very pale, glabrous. *Leaves* coriaceous, oblong, shortly acuminate, the base cuneate, the edges slightly recurved (when dry) ; upper surface shining, glabrous : the lower dull, puberulous, the midrib very prominent : main nerves 10 to 14 pairs, very slender, spreading, more conspicuous above than below : length 6 to 10 in., breadth 2·25 to 2·75 in. ; petiole ·25 in., deeply channelled. *Flowers* very large, from the axils of fallen leaves and from the younger branches ; peduncles recurved, 1 in., or more, long (elongated in the fruit), pubescent. *Sepals* ovate, acute, pubescent outside, spreading or recurved, about 5 in. long. *Petals* very coriaceous, yellowish tinged with green ; the outer broadly ovate to ovate-oblong, with a dark thick triangular spot at the base, 3 to 5 in. long, minutely pubescent ; the inner only about ·6 in. long, ovate-acute, densely golden sericeous.

Anthers very numerous, their apices convex. *Ovaries* hairy, 2-ovuled : style long, slender, much curved ; stigma 2-lobed. *Ripe carpels* oblong, apiculate, tapering much to the stalk, minutely granular and with obscure vertical ridges when dry, 1·25 to 1·5 in. long and ·6 in. in diam. : stalks ·75 in., stout. *Seeds* 1 or 2, oblong, slightly compressed, the testa brown. Hook. fil. Fl. Br. Ind. I, 75 : Miq. Fl. Ind. Bat. I, pt. 2, 28. *Uvaria gigantea*, Wall. Cat. 6469 A. B. (*in part*). *Anonacea* Griff. Icon. Plant. t. 652 ?

Singapore ; Wallich, Ridley, Hullett. Penang ; Curtiss. Perak ; King's Collector.

6. GONIOTHALAMUS MALAYANUS, Hook. fil. and Thoms. Fl. Ind 107. A small glabrous tree, 15 to 20 feet high ; bark of branches very pale. *Leaves* coriaceous, oblong to elliptic-oblong, shortly and abruptly acuminate, the base slightly cuncate, rarely rounded, the edges recurved ; upper surface shining, the lower dull, darker (when dry) ; main nerves 12 to 15 pairs, sub-horizontal, faint ; length 5·5 to 9 in., breadth 1·5 to 2·75 in. ; petiole ·25 in., deeply channelled. *Flowers* slightly supra-axillary, solitary, greenish ; pedicels ·35 to ·5 in., pubescent, bracteolate at the base. *Sepals* ovate-triangular, acuminate, pubescent, connate at the base, persistent, ·25 in. long. *Petals* coriaceous, the outer broadly ovate, acuminate to ovate-lanceolate, minutely tomentose on both surfaces, with a triangular glabrous basal spot, keeled outside, 1 to 1·25 in. long ; the inner about a third as long, ovate, acuminate, sericeous or tomentose. *Anthers* numerous. *Pistils* about 15, the ovary hairy, ovules 3 to 4 ; style long, slender, much bent outwards ; stigma sub-capitate, unequally 2-lobed. *Ripe carpels* narrowly oblong apiculate, tapering to each end, glabrous, 1·5 in. long, and ·5 in. in diam. ; stalks ·1 in., thick. *Seeds* 2 or 3, flattened-ovoid, nearly black. Hook. fil. Fl. Br. Ind. I, 75 ; Miq. Fl. Ind. Bat. I, Pt. 2, 28. *Goniothalamus Slingerlandtii*, Scheff. Tijdsch. Ned. Ind. XXXI, 341. *Uvaria* sp. Griff. Notul. IV, 710.

Malacca ; Griffith, Maingay (Kew Distrib.) No. 63. Perak ; common. Distrib. Bangka.

7. GONIOTHALAMUS FULVUS, Hook. fil. and Thoms. Fl. Br. Ind I, 75. A shrub : young branches slender, dark-coloured, at first rufous-pubescent, afterwards glabrous. *Leaves* membranous, pellucid-dotted, oblong-oblancoleolate, obtuse or with a short broad point ; upper surface glabrous, the lower puberulous ; main nerves 14 to 16 pairs, slightly prominent beneath, spreading ; length 7 to 10 in., breadth 2·5 to 3·25 in. ; petiole ·3 in., pubescent. *Flowers* solitary, axillary, pedicels ·25 in., puberulous. *Sepals* broadly ovate, obtuse, pubescent, connate at the base, ·25 in. long. *Petals* coriaceous, densely sericeous, the outer oblong-

lanceolate, attenuate to the apex, slightly keeled outside, 1 to 1.25 in. long; inner about .3 in. long, ovate, acute. *Stamens* numerous, apices of anthers very convex, puberulous. *Ovaries* oblong, pubescent; style cylindrical, glabrous: stigma bifid. *Fruit* unknown.

Malacca; Griffith.

Known only by Griffith's imperfect specimens.

8. *GONIOTHALAMUS CURTISII*, King, n. sp. A shrub or small slender tree: young branches densely rusty-tomentose, the larger pale and glabrous. *Leaves* stoutly membranous, narrowly oblong to obovate-oblong, more or less abruptly and shortly acuminate, slightly narrowed to the rounded base; upper surface shining, glabrous except the puberulous midrib; the lower sparsely puberulous, the midrib and nerves dark rusty-tomentose; the latter 28 to 34 pairs, sub-horizontal, inter-arching near the margin, very prominent, as is the midrib, on the lower and depressed on the upper surface: length 9 to 15 in., breadth 3 to 5.5 in.; petiole .35, channelled, pubescent. *Flowers* solitary, from the stem; pedicels stout, decurved, with two deciduous bracteoles at the base, .6 in. long. *Sepals* large, green, rigidly membranous, conjoined into a cup with 3 broadly-ovate, sub-acute teeth, boldly nerved and reticulate, minutely rufous-pubescent, persistent; length from .75 to 1 inch. *Petals* coriaceous, velvety-tomentose, yellowish, tinged with red: the outer broadly lanceolate, acuminate, slightly narrowed and thickened at the base, from 1.25 to 1.75 in. long; the inner rather more than one-third as long, ovate, acuminate. *Anthers* numerous, compressed, linear, with acute granular conical apices. *Ovaries* numerous, narrowly elongate, densely pubescent, 1-ovuled; style straight; stigma oblique, minutely lobed. *Ripe carpels* obliquely ovoid with long pointed, slightly hooked apices, rufous-pubescent, .75 in. long: stalks only .1 in. long, stout.

Selangor; Curtis, Nos. 310 and 2316. Perak; King's Collector, No. 10548: Scortechini, No. 660.

A very distinct species.

9. *GONIOTHALAMUS GRIFFITHII*, Hook. fil. and Th. Fl. Ind., 110. A large shrub or small tree; all parts glabrous except the ovaries and carpels: young branches dark-coloured. *Leaves* coriaceous, oblong, sub-acute, or shortly and obtusely acuminate, the base cuneate; both surfaces shining and reticulate; main nerves 12 to 20 pairs, faint, spreading, inter-arching within the edge: length 7 to 12 in., breadth 1.8 to 3.5 in.; petiole .25 to .5 in., thick. *Flowers* solitary, axillary or extra-axillary; pedicel .5 to 1 in. long with a few scale-like bracteoles near the base. *Sepals* thinly coriaceous, orbicular-ovate, blunt, connate below, nerved and reticulate, persistent, .5 to .75 in. long. *Petals* thickly coriaceous;

the outer broadly lanceolate, acuminate, 1·5 to 2·5 in. long: the inner ovate, acute, '6 to '8 in long. *Anthers* with an acute apical process. *Ovaries* strigose: style long, subulate; stigma slightly bifid. *Ripe carpels* sub-sessile, oblong, '5 or '6 in. long, glabrescent or glabrous. Hook. fil Fl. Br. Ind. I, 73; Kurz F. Flora Burma, I, 42.

Burmah: Mergui, Griffith. Moulmein, Falconer.

10. *GONIOTHALAMUS MACROPHYLLUS*, H. f. and Th. Fl. Ind. I, 74. A glabrous shrub 5 to 15 feet high; young branches very stout, dark-coloured. *Leaves* coriaceous, large, oblong-lanceolate to oblong-oblong-ovate, acute or shortly acuminate, slightly narrowed to the sub-acute or rounded base; main nerves 16 to 20 pairs, spreading, impressed above and slightly prominent beneath; length 10 to 18 in., breadth 2·5 to 4·5 in.; petiole '6 to 1 in., very stout. *Flowers* slightly supra-axillary or from the branches below the leaves, solitary or in pairs, green; pedicels '35 in. long, sub-clavate. *Sepals* broadly ovate, acute, connate at the base, '65 in., long, slightly puberulous, tinged with purple. *Petals* coriaceous, the outer oblong-lanceolate, acute or acuminate, 1 to 1·5 in. long; the inner half as long, ovate, acuminate, the edges ciliate. *Stamens* numerous, linear. *Ovaries* 12 to 18, glabrous, 1-ovuled; style slender, dilated above, stigma 2-lobed. *Ripe carpels* globular-obovoid, slightly apiculate, glabrous, '4 in. long. *Seed* pale brown. Miq. Fl. Ind. Bat. I, Pt. 2, 28; Ann. Mus. Lugd. Bat. II, 38. *Polyalthia macrophylla*, Blume Fl. Jav. Ann. 79 t. 39. *Unona macrophylla*, Blume Bijdr. I, 17.

It is possible that two species may be included here, there being some difference between the specimens in the nervation of the leaves.

Malacca; Griffith, Maingay, (Kew Distrib.) No. 62. Perak, King's Collector. Penang; Curtis. Kedah; Curtis. Distrib. Sumatra, Forbes, 1370.

11. *GONIOTHALAMUS RIDLEYI*, King, n. sp. A tree: young branches slender, puberulous. *Leaves* membranous, broadly elliptic, shortly and abruptly acuminate, the base sub-acute, pale when dry; both surfaces reticulate; the upper dull, glabrous, except the puberulous midrib and nerves, the lower shining, puberulous on the midrib, nerves and reticulations; main nerves about 6 pairs, curving, ascending; length about 8 in.; breadth 4·5 in.; petiole '25 in., puberulous. *Flowers* 1·75 to 2 in. long, in fascicles on long pedicels from warted, puberulous, woody tubercles on the stem: pedicels 2·5 to 3·5 in. long, minutely nerved at the base. *Sepals* coriaceous, broadly ovate-elliptic, obtuse, bracted, '6 in. long, free, spreading, puberulous. *Petals* coriaceous, pale brown; the outer elliptic-oblong to ovate, obtuse or sub-acute, with a broad thickened claw, puberulous, 1·65 to 2 in. long; inner row a little longer than the sepals, obovate, apiculate, with narrow claw. *Stamens* numerous,

long, narrow, much compressed; the apical process of the connective small, sub-conic. *Ovaries* oblong, narrow; style cylindric, puberulous; stigma 2-lobed. *Ripe carpels* obovoid-globular, tapering slightly to the short stalk, glabrous, about 1 in. long.

Singapore; at Sunga Murai, Ridley.

It is possible that in the above description the size of the leaves may be understated, as the only one which I have seen may not be of average size.

12. GONIOTHALAMUS TAPIS, Miq. Fl. Ind. Bat. Suppl. 371. A tree 15 to 40 feet high; all parts, except the flowers, glabrous; young branches pale brown. *Leaves* coriaceous, oblong, abruptly shortly and bluntly acuminate, the base rounded or slightly cuneate, the edges recurved (when dry); both surfaces dull, brown when dry, the lower paler; main nerves 10 to 12 pairs, thin, spreading, very indistinct, the midrib prominent beneath; length 5.5 to 9 in., breadth 2.5 to 3.25 in., petiole .3 in. *Flowers* solitary and supra-axillary, or in fascicles from tubercles on the branches; pedicels curved, .4 in. long, bracteolate at the base. *Sepals* free, ovate, acute, spreading, pubescent, persistent, .4 in. long. *Petals* coriaceous, puberulous; the outer ovate-lanceolate, acuminate, contracted and thickened at the base, 1.75 in. long; the inner ovate, acute, much contracted and thickened at the base, .65 in. long. *Anthers* numerous and with conical apices. *Ovaries* narrow, hairy; style straight; ovules solitary. *Stigma* sub-discoid-capitate, 2- to 3-lobed. *Ripe carpels* crowded, obovoid, smooth, sub-sessile, .4 to .5 in. long. Miq. Ann. Mus. Lugd. Bat. II, 35.

Perak; at low elevations, very common; Scortechini, Wray, King's Collector. Penang and Pangkore; Curtis. Distrib. Sumatra, Borneo.

13. GONIOTHALAMUS SCORTECHINII, King, n. sp. A shrub or small tree, glabrous, except the flowers; young branches with rather pale striate bark. *Leaves* membranous, oblanceolate or oblong-oblanceolate, very shortly acuminate, narrowed from the above the middle to the acute or sub-acute base; when dry the upper surface greenish, the lower pale brown; main nerves 18 to 24 pairs, spreading and inter-arching near the edges, slender, slightly prominent beneath; length 10 to 15 in., breadth 2.75 to 4 in., petiole .3 in. *Flowers* solitary, rarely in pairs, from the branches below the leaves; pedicels clavate, decurved, bi-bracteolate at the base, .5 in. long. *Sepals* rigidly membranous, large, orbicular-ovate, obtuse or sub-acute, much nerved and reticulate, connate below, persistent, from .65 to 1 in. long (according to age). *Petals* coriaceous, rusty-puberulous; the outer oblong-lanceolate, sub-oblique, not much longer than the full grown sepals; the inner broadly ovate, acute, about .5 in. long. *Anthers* numerous, narrow, with elongate, conical apical pro-

cesses. *Ovaries* narrow, puberulous, 1-ovuled; style straight; stigma 2- or 3-lobed. *Ripe carpels* crowded, ovoid-oblong, apiculate, glabrous, narrowed to the short stalks, .45 in. long; stalks .2 to .25 in. *Seed* smooth, pale.

Perak; at low elevations; Scortechini, Wray, King's Collector.

The leaves of this species much resemble those of *Polyalthia oblonga*, King.

14. *GONIOTHALAMUS WRAYI*, King, n. sp. A shrub 3 to 12 feet high, glabrous, except the flowers: young branches slender, very pale. *Leaves* membranous, oblanceolate to lanceolate or oblong, shortly and bluntly acuminate, the base cuncate: both surfaces pale (when dry), obscurely reticulate: main nerves 14 to 18 pairs, spreading, straight, slender and very slightly prominent even when dry: length 4.5 to 9 in., breadth 1.25 to 2 in., petiole .2 to .25 in. *Flowers* solitary, slightly supra-axillary; pedicels slender, decurved, minutely bracteolate, .35 in. (elongated to .75 in. in fruit). *Sepals* membranous, slightly nerved and reticulate, ovate, acuminate, spreading or recurved, puberulous outside, .2 in. long, persistent. *Petals* sub-coriaceous, greenish-yellow, puberulous: the outer narrowly lanceolate, acuminate, the bases thickened and not narrowed to a claw, .65 to .75 in. long: inner petals about half as long, ovate-acuminate. *Anthers* numerous, half as long as the ovaries, compressed, their apices with a long thin point from a broad base. *Ovaries* about 20, narrowly cylindrical, hairy like the stout, straight style 1- to 2-ovuled: stigma truncate. *Ripe carpels* narrowly obovoid to oblong, apiculate, gradually tapering to the stalk, glabrous, .6 in. long. *Seeds* usually 1, rarely 2, oblong.

Perak: at low elevations very common; Wray, Scortechini, King's Collector.

15. *GONIOTHALAMUS UVARIOIDES*, King, n. sp. A shrub 6 to 15 feet high: all parts glabrous except the flower and fruit; young branches pale. *Leaves* thinly coriaceous, oblong, slightly obovate, slightly narrowed to the minutely cordate base: both surfaces rather dull when dry, the lower pale brown, the edges slightly recurved; main nerves 22 to 25 pairs, spreading, rather straight, inter-arching near the margin; length 10 to 15 in., breadth 3 to 6 in.; petiole .4 in., stout, channelled. *Flowers* on the trunk, (solitary?); pedicels curved, stout, .35 in. long. *Sepals* coriaceous, semi-orbicular, blunt, pubescent, 2 in. long. *Petals* very coriaceous, yellow: the outer broadly lanceolate, thickened and truncate at the base, rufous-pubescent, 1.5 in. long: inner petals like the outer but with contracted bases and only 1 to 1.2 in. long. *Anthers* with conical apices. *Ovaries* hairy; style cylindrical; stigma small, truncate, minutely bifid. *Ripe carpels* oblong, tapering to each end, puberulous,

1.5 in. long, and .65 in. in diam.; stalks .7 in. long. *Seeds* 4, compressed, rugose, .5 in. long.

Perak: Ulu Slim, King's Collector, No. 10664. Ulu Bubong, King's Collector, No. 10126. Distrib., Borneo; Motley, No. 960.

Motley's Bornean specimen above-quoted is in flower only; but it so entirely resembles in leaves and wood those of my collector in Perak which are in fruit only, that I have ventured not only to consider them as belonging to the same species, but to draw up the above description of the flowers from the Bornean and of the fruit from the Perakian specimens. The species resembles *G. fulvus* in leaves and flower and *G. malayanus* in flower. The fruit is more like that of a *Uvaria* than of a *Goniothalamus*, having 4, sub-horizontal, rugose seeds.

15. OROPHEA, Blume.

Trees or shrubs. *Flowers* usually small, axillary, solitary, fasciated or cymose. *Sepals* 3, valvate. *Petals* 6, valvate in 2 series; outer ovate; inner clawed, usually cohering by their margins into a mitriform cap; sometimes oblong and slightly approximate below the middle, the apices divergent not vaulted: rarely without claws and in one species slightly imbricate. *Stamens* definite, 6-12, ovoid, fleshy; anther-cells dorsal, large, contiguous, the connective sometimes prolonged into a conical apical point, not truncate. *Staminodes* 0, or 3 to 6. *Ovaries* 3-15; style short or 0; ovules 4. *Ripe carpels* 1- or more-seeded, globular or oblong (very long in several species.)—DISTRIB. Species about 25; all Eastern Asiatic.

Intermediate between *Mitrephora* and *Bocagëa*, having the perianth of the former and stamens of the latter.

Inner petals distinctly vaulted, the limbs coherent by their edges.

Stamens 12 1. *O. setosa*.

Stamens 6.

Leaves glabrous at all ages (see also No. 5) 2. *O. Katschallica*.

Leaves more or less pubescent (except

No. 5).

Carpels globose when ripe ... 3. *O. hirsuta*.

Carpels oblong when ripe.

Carpels under 2 in. in length ... 4. *O. hexandra*.

Carpels 3 to 5 in. long.

Leaves quite glabrous, main

nerves 6 or 7 pairs ... 5. *O. enterocarpa*.

Leaves puberulous beneath,

main nerves 10 or 12 pairs 6. *O. maculata*.

Inner petals slightly vaulted, trapezoid ... 7. *O. gracilis*.

Inner petals spreading, not vaulted and not trapezoid.

Stamens 10 or 12.

Inner petals hastate; ripe carpels globular 8. *O. hastata*.

Inner petals linear-oblong, the apices
divergent and recurved; ripe carpels
ovoid or slightly obovoid 9. *O. dodecandra*.

Stamens 6.

Inner petals cuneiform or cuneiform-retuse;
ripe carpels cylindric 10. *O. cuneiformis*.

Inner petals irregularly oblong, their
apices broad and curved outwards, ripe
carpels globular 11. *O. polycarpa*.

1. *OROPHEA SETOSA*, King, n. sp. A shrub: young branches densely covered with a layer of minute pubescence with numerous, long, brownish, straight bristles projecting beyond it; the older branches dark-coloured and almost glabrous. *Leaves* membranous, oblong or oblong-oblanccolate, shortly acuminate, the base rounded: main nerves 8 to 10 pairs, oblique, inter-arching near the edge; both surfaces sparsely setose, more densely so on the midrib and nerves, the lower also with sparse, minute pubescence; length 5.5 to 7.5 in., breadth 2 to 2.75 in., petiole .05 in., setose. *Flowers* solitary, extra-axillary, about .2 in. in diam. when expanded: pedicels very slender, .75 in. long, pubescent, with a single minute bracteole below the middle. *Sepals* sub-orbicular, blunt. *Outer petals* much larger than the sepals, broadly ovate, sub-acute, pubescent outside and glabrous inside like the sepals. *Inner petals* longer than the outer, vaulted, .22 in. long, the limb trapezoid-sagittate, pubescent on the back and edges, glabrous in front; the claw narrow, shorter than the limb. *Male flower* stamens numerous, cuneate, the connective broadly truncate at the apex. *Ovaries* unknown. *Ripe carpels* 4 or 5, sessile, globose or oblong-globose, .3 in. in diam., densely and minutely pubescent and with a few long setae besides. *Seeds* solitary, rarely 2; the testa pale, rather rough; the albumen very dense.

Perak: at elevations from 800 to 1,200 feet; King's Collector, Seortechini.

2. *OROPHEA KATSCHALICA*, Kurz in Trimen's Journ. Bot. 1875, p. 323. A small tree 25 to 30 feet high: young branches slightly puberulous at first, ultimately glabrous, black and furrowed. *Leaves* membranous, oblong-lanceolate to oblong or elliptic, shortly and bluntly acuminate, the base sub-cuneate or rounded; upper surface glabrous, shining; the lower much reticulate, slightly adpressed-puberulous; main nerves 3 to 10 pairs, ascending, slender; length 4 to 7 in., breadth

1·5 to 2·75 in., petiole ·15 in. *Peduncles* extra-axillary, solitary, ·5 to ·75 in. long, with numerous ovate-acuminate, rusty-pubescent bracts. *Flowers* 1 to 4, rather large; their pedicels about ·4 in. long, pubescent and with a single adpressed ovate-lanceolate bracteole. *Sepals* ovate-acuminate, adpressed-pubescent outside, sub-glabrescent inside. *Outer petals* much larger than the sepals, ovate-orbicular, acute, veined, pubescent on the outer surface and on the upper half of the inner, ·4 in. long. *Inner petals* ·75 in. long, trapezoid, acute, tomentose on both surfaces except a glabrous patch bearing a transverse callosity on the inner; the claw long, narrow and glabrous. *Stamens* 6 perfect, with a few imperfect in an outer row: anther-cells large, dorsal; the connective oblique, slightly produced above their apices. *Ovaries* about 3, narrowly ovoid, densely sericeous, 3-ovuled; stigmas sessile, truncate. *Fruit* unknown.

Nicobar Islands; Kurz, King's Collector.

3. *OROPHEA HIRSUTA*, King, n. sp. A shrub 8 to 12 feet high: young branches at first densely rufous-hirsute, afterwards becoming glabrous and dark-coloured. *Leaves* elliptic or elliptic-oblong, often slightly obovate, shortly and bluntly acuminate, narrowed from below the middle to the rounded minutely cordate base: upper surface glabrous, shining, the lower pale, dull, sparsely hirsute, the midrib setose at the base: main nerves 8 to 9 pairs, spreading, very faint: length 3·5 to 4·5 in., breadth 1·24 to 1·75 in.; petiole ·05, setose. *Peduncles* extra-axillary, about ·5 in. long, 1- to 3-flowered, rufous-hirsute like the pedicels: pedicels about ·75 in. long and with several minute bracteoles. *Flowers* ·5 in. in diam. *Sepals* broadly ovate, acute, coarsely hirsute outside and on the edges, glabrous inside. *Outer petals* much larger than the sepals, broadly obovate, blunt, sparsely pubescent outside and on the edges, glabrous inside, ·15 in. long. *Inner petals* ·25 in. long, vaulted: the limb trapeziform, rather thick, glabrous outside, pubescent inside; the claw very narrow, longer than the limb, glabrous. *Stamens* 6, in a single row, curved: anthers broad, dorsal, the connective not produced above their apices. *Ovaries* about 6, ovoid, glabrous, 1- to 2-ovuled: stigma sessile, roundish. *Carpels* 4 to 5, globular, yellow when ripe, sparsely hirsute, ·4 in. in diam.; stalks ·1 in.

Perak: King's Collector, No. 4283.

Only once collected. In its leaves this resembles *Mitrephora setosa*. King.

4. *OROPHEA HEXANDRA*, Blume Bijdr. 18. A small tree: young branches slender, minutely tomentose, soon becoming dark-coloured, glabrous and furrowed. *Leaves* thinly coriaceous, oblong-lanceolate to elliptic-oblong, rather abruptly acuminate, the base sub-cuneate or

rounded; upper surface glabrous, shining; the lower reticulate, puberulous, the midrib pubescent; main nerves 7 to 9 pairs, oblique: length 4·5 to 6 in., breadth 1·5 to 2·25 in., petiole ·2 in. *Peduncles* axillary or supra-axillary, slender, 1- to 3-flowered, pubescent; bracts several, subulate, hairy. *Flowers* about ·35 in. long, greenish-white. *Sepals* minute, ovate to ovate-lanceolate, densely pubescent outside. *Outer petals* thin, ovate-cordate, acuminate, pubescent; the inner larger, trapezoid with long narrow claw, glabrous with pubescent margins. *Stamens* 6, in one row. *Ovaries* about 6, pubescent, 2-ovuled. *Ripe carpels* oblong, subsessile, acuminate, minutely adpressed-pubescent, 1·4 to 1·75 in. long. *Seeds* usually solitary, sometimes ·2 in. long, narrowly cylindrical. Kurz For. Flora Burma, I, 49; Miq. Fl. Ind. Bat. I, pt. 2 p. 29. *O. acuminata*, A. D. C. in Mem. Soc. Genev. V, 39; Hook. fil. and Thoms. Fl. Ind. 112; Hook. fil. Fl. Br. Ind. I, 91; Wall. Cat. 6432. *Bocagea hexandra*, Blume Fl. Jav. Anon. 83 t. 40.

Burma prov. Tenasserim, Wallich. Great Coco Island; Kurz. S. Andaman; King's Collectors.

Pierre (Flore Forestiere Cochinchine t. 44) figures a species called *O. Thorelii* which, as he remarks, must be closely allied to this.

5. *OROPHEA ENTEROCARPA*, Maingay ex Hook. fil. Fl. Br. India, I, 92. A small tree 15 to 30 feet high; all parts, except the inflorescence, glabrous: young branches slender, black, striate. *Leaves* membranous, ovate or sometimes obovate-lanceolate to elliptic, acuminate (sometimes abruptly so); the base rounded, sometimes sub-cuneate; both surfaces shining: main nerves 6 or 7 pairs, spreading, slender: length 2·5 to 5 in., breadth 1·2 to 2 in., petiole ·1 in. *Flowers* nodding, solitary, extra-axillary: the pedicels very slender, ·75 to 1·25 in. long, glabrous below, pubescent above and with several ovate-lanceolate bracteoles. *Sepals* small, broadly ovate, acuminate, pubescent. *Outer petals* much larger than the sepals, ovate, acuminate, puberulous, the inner a little longer (·6 to ·75 in. long); the limb elongated-trapezoid, puberulous; the claw narrow and glabrous, yellowish with a reddish band; staminodes 6. *Stamens* 6, with broad connective, not apiculate. *Ovaries* 6, cylindrical, glabrous, 2- to 7-ovuled; stigma small, sessile. *Carpels* 4 to 6, elongate-cylindrical, glabrous, moniliform when dry, 3 to 5 in. long and ·3 in. in diam. *Seeds* 2 to 7, linear-oblong.

Malacca: Maingay. Perak; Scortechini, King's Collector.

6. *OROPHEA MACULATA*, Scortechini MSS. A shrub or small tree: young branches slender, rusty-tomentose at first, afterwards glabrous, black and striate. *Leaves* membranous, elliptic-oblongate, caudate-acuminate, narrowed from below the middle to the rounded or sub-cuneate slightly unequal base: upper surface glabrous, the lower

glabrescent, the midrib and nerves pubescent; main nerves 10 to 12 pairs, spreading, rather faint; length 3·25 to 7 in., breadth 1·5 to 2·25 in., tomentose. *Peduncles* solitary, 1- to 3-flowered, extra-axillary, very slender, ·5 to 1 in. long, pubescent, with numerous, distichous, sub-deciduous, linear-lanceolate, pubescent bracts. *Flowers* large, sub-pendulous. *Sepals* narrowly lanceolate, acuminate. *Outer petals* larger than the sepals, mottled red and yellow, ovate, very acuminate, veined, pubescent on both sides, ·5 in. long. *Inner petals* 1 in. long, with lanceolate, much acuminate, very pubescent limb; the claw long, narrow, pubescent. *Stamens* 6, broad, not apiculate, hairy at the base. *Staminodes* 3, orbicular. *Ovaries* 3 to 6, cylindrical, very hirsute, 6- or 7-ovuled: stigma sessile. *Carpels* 4 to 6, much elongate, cylindrical, puberulous, 3 to 5 in. long, and about ·3 in. in diam., moniliform when dry. *Seeds* 4 to 7, linear-oblong.

Perak; Scortechini, King's Collector.

7. *OROPHEA GRACILIS*, King, n. sp. A tree 20 to 30 feet high; young branches slender, at first minutely tomentose, afterwards darkly cinereous and glabrous. *Leaves* thinly coriaceous when adult, lanceolate, much acuminate, the base cuneate or slightly rounded, both surfaces glabrous: main nerves 5 or 6 pairs, spreading, inter-arching far from the edge, very indistinct; length 2·5 to 3·5 in., breadth ·9 to 1·2 in., petiole ·05 in. *Flowers* solitary, ·25 in. in diam., extra-axillary; pedicels ·75 to 1 in. long, very thin, glabrous, jointed, and with several minute, subulate bracteoles above the middle. *Sepals* broadly ovate, sub-acute, connate at the base, spreading or reflexed. *Outer petals* larger than the sepals, ovate, acute, ·15 in. long; both surfaces glabrous, the edges alone minutely pubescent. *Inner petals* ·25 in. long, slightly vaulted; the limb thick, trapezoid, with pubescent edges; the claw narrow, not so long as the limb, glabrous. *Stamens* 6, in a single row, the connective much produced above the rather small dorsal anther-cells. *Ovaries* 4 to 10, ovoid, glabrous, 2-ovuled: stigma large, sessile. *Ripe carpels* 6 to 10, globular, glabrous, ·45 in. in diam., their stalks ·25 in. long. *Seeds* solitary or two together, depressed-globose, with a transverse groove and ridge, shining, pale.

Perak: Scortechini, King's Collector.

This is closely allied to the W. Peninsular *O. uniflora*, but that species has twice as many stamens.

8. *OROPHEA HASTATA*, King, n. sp. A tree 20 to 40 feet high: all parts glabrous except the inflorescence: young branches rather slender, dark-coloured. *Leaves* thinly coriaceous, elliptic to elliptic-oblong, shortly caudate-acuminate; the base cuneate, rarely rounded; both surfaces shining, the lower pale: main nerves 6 to 8 pairs, spreading,

inter-arching within the edge; length 3·5 to 5·5 in., breadth 1·6 to 2·4 in., petiole ·2 in. *Peduncles* axillary or supra-axillary, solitary, about ·25 in. long, bearing towards the apex 3 or 4 1-bracteolate, pubescent pedicels. *Flowers* ·4 in. long. *Sepals* broadly ovate, acute, pubescent, outside, glabrous inside as are the outer petals. *Outer petals* twice as large as the sepals, broadly ovate acute. *Inner petals* ·35 in. long; the limb hastate, triquetrous, thickened, the edges and the base ciliate; the claw long, narrowed to the base, glabrous. *Staminodes* 0. *Stamens* 10, in 2 rows, curved, slightly apiculate; the anther-cells large. *Ovaries* about 10, obliquely oblong, curved, pubescent, 2-ovuled; stigma small, capitate, sessile. *Ripe carpels* 5 or 6, globular, glabrous, ·4 in. in diam., their stalks about ·25 in. *Seeds* solitary.

Perak: Wray, King's Collector, at low elevations.

This is closely allied to *O. dodecandra*, Miq.

9. OROPHEA DODECANDRA, Miq. in Ann. Mus. Lugd. Bat. II, 25. A tree 20 to 40 feet high; young branches sparsely adpressed-pubescent, afterward glabrous dark-coloured and striate. *Leaves* membranous, elliptic, rarely elliptic-oblong, slightly unequilateral, shortly caudate-acuminate, the base cuneate; upper surface glabrous, shining, the lower paler with a few scattered, pale, adpressed hairs; main nerves 5 or 6 pairs, bold beneath, inter-arching ·25 in. from the margin; length 3·5 to 5·5 in.; breadth 1·75 to 2·3 in., petiole ·2 in. stout, channelled. *Peduncles* supra-axillary, longer than the pedicels, 3- to 7-flowered, glabrous; pedicels ·5 in. long, clustered near the apex, bracteolate above the middle. *Flowers* ·5 in. long. *Sepals* smaller than the outer petals, spreading, dotted, conjoined at the base, slightly tubercular outside, glabrous inside. *Outer petals* broadly ovate, acuminate, narrowed at the base, ·15 in. long. *Inner petals* thick, linear-oblong, blunt, puberulous outside, slightly arched below the middle, the apices divergent and recurved. *Staminodes* 0. *Stamens* 12, in 2 rows; the connective rather narrow, prolonged beyond the apices of the large, broad, dorsal anthers. *Ovaries* 6 to 8, oblong, curved, oblique, glabrous, 2-ovuled; stigma oblong, sessile. *Ripe carpels* ovoid or slightly obovoid, blunt, glabrous, ·85 in. long; their stalks ·8 to ·9 in. *Seed* solitary, sub-rotund or oblong, with rugose, pale, scaly testa.

Perak; Scortechini, King's Collector; at low elevations.

10. OROPHEA CUNEIFORMIS, King, n. sp. A tree 20 to 40 feet high; young parts rusty-pubescent or tomentose; the branchlets rather stout; ultimately glabrous, dark-coloured and furrowed. *Leaves* thinly coriaceous, oblong, narrowly elliptic or oblanceolate-oblong, more or less sharply acuminate, very little narrowed to the rounded or minutely cordate base; upper surface at first with many long, thin, pale,

adpressed hairs, ultimately glabrous; lower softly but rather coarsely pubescent, the midrib and 8 to 12 pairs of oblique, rather prominent main nerves rufous-tomentose; length 3·5 to 6 in., breadth 1·1 to 2·2 in.; petiole ·05, tomentose. *Peduncles* 4- or 5-flowered, solitary, supra-axillary, slender, sub-glabrous below, rufous-sericeous above, longer than the pedicels; bracts numerous, linear-lanceolate; pedicels ·3 in. long, rufous-sericeous like the outer surface of the sepals and outer petals, bracteolate at the base. Flower buds globose. *Sepals* ovate, much acuminate, glabrescent inside like the outer petals. *Outer petals* ovate, acute, veined. *Inner petals* with a cuneiform, sometimes retuse, thick limb and a short, narrow claw. *Staminodes* 3, in an outer row, sub-orbicular, fleshy. *Stamens* 6, with broad flat connective, not produced at the apex, and large dorsal anthers. *Ovaries* about 6, oblong, oblique, densely villous, 2- or 3-ovuled, *Stigma* sessile, broad. *Ripe carpels* 2 to 4, sessile, cylindric, tapering a little at each end, puberulous, 1·5 to 1·75 in. long and about ·35 in. in diam. *Seeds* 2, oblong.

Perak; Scortechini, King's Collector.

This is readily distinguished from the closely allied species *O. maculata*, by its scorpioid cymes, globular flower-buds, and by the cuneiform (not lanceolate) limbs of its petals.

11. *OROPHEA POLYCARPA*, A. DC. in Mem. Soc. Genev. V, 39. A large shrub or small tree: young branches slender, pubescent at first, but speedily glabrous, furrowed and dark-coloured. *Leaves* membranous, ovate to ovate-oblong, obtusely and very shortly acuminate, the margins undulate, the base rounded or narrowed; both surfaces glabrous; main nerves 6 to 8 pairs, spreading, faint; length 2 to 4 in., breadth 1 to 1·75 in., petiole ·05 in. *Peduncles* axillary or supra-axillary, slender, 1- to 3-flowered, pubescent; bracteoles several. *Sepals* ovate, acute, very pubescent. *Outer petals* ovate, acuminate, more than twice as large as the sepals, pubescent on the outer, glabrous on the inner, surface. *Inner petals* twice as long as the outer, irregularly oblong, the apices broad and curved outwards, the base slightly narrowed, puberulous outside, glabrous within, ·4 in. long. *Stamens* 6 or 7 in a single row; the anther-cells quite dorsal, separate, the connective flat and very slightly prolonged above their apices. *Ovaries* about twice as many as the stamens, glabrous, ovate, oblique: stigma small, sessile, sub-capitate. *Ripe carpels* globular, glabrous, shining, ·35 in. in diam.: their stalks ·25 in. long. *Seeds* 1 or 2. Hook. fil. and Thoms. Fl. Ind. 111; Hook. fil. Fl. Br. Ind. I, 91; Kurz F. Flora Burma, I, 49; *Anonacea* Griff. Ic. Pl. Ind. Or. IV, t. 654. Wall. Cat. 6431. *Bocagea polycarpa*, Steud. Nomen. 212. *Melodorum? monospermum* Kurz in Andaman Report, App. B. p. 1. *Bocagea polycarpa*, Steud.

S. Andaman; Kurz, King. *Burmah*: Martaban, Wallich.

Orophea undulata, (Pierre Fl. Forest. Coch.-Chine t. 45) must be closely allied to this, as must also the same author's *O. anceps*, (l. c. t. 46).

16. MITREPHORA, Blume.

Trees. *Leaves* coriaceous, strongly ribbed, plaited in veneration. *Flowers* usually terminal or leaf-opposed, sometimes 1-sexual. *Sepals* 3, orbicular or ovate. *Petals* 6, 2-seriate, valvate; outer ovate, thin, veined; inner clawed, vaulted and cohering. *Stamens* oblong-cuneate; the anther-cells dorsal, remote, the connective broadly truncate at the apex. *Ovaries* oblong; style oblong or clavate, ventrally furrowed; ovules 4 or more, 2-seriate. *Ripe carpels* globose or ovoid, stalked or sub-sessile.—DISTRIB. Species about 10; tropical Asiatic.

Flowers hermaphrodite	...	...	...	1. <i>M. Maingayi</i> .
Flowers unisexual.				
Ripe carpels ovoid, apiculate, rugulose	...	2. <i>M. reticulata</i> .		
" " globose, not apiculate, not rugulose		3. <i>M. macrophylla</i> .		
" " sub-globose, sub-truncate at each end, rugulose	...	4. <i>M. Prainii</i> .		

1. MITREPHORA MAINGAYI, Hook. fil. and Thoms. Fl. Br. Ind. 1, 77.

A tree 20 to 50 feet high: young branches softly rufous-tomentose afterwards glabrous dark-coloured and striate. *Leaves* coriaceous, oblong to ovate, (oblong-lanceolate in var. *Kurzii*), acute or shortly and bluntly acuminate, the base rounded or sub-cuneate; upper surface shining, glabrous except the pubescent midrib; under surface glabrescent, the midrib and nerves thinly adpressed-pubescent; (pubescent in var. *Kurzii*); main nerves 6 to 10 pairs, oblique, curving, slightly prominent beneath: length 3 to 5.5 in., breadth 1.5 to 2 in., petiole .3 to .4 in. *Flowers* 1 in. or more in diam., axillary or leaf-opposed, solitary or 2 or 3 in a multi-bracteolate and tomentose raceme; pedicels .5 to 1.5 in. (lengthening with age), bracteolate. *Sepals* connate into a cup, broadly ovate, acute, (or obtuse in var.) tomentose. *Petals* rather thinly pale yellow mottled with red, all more or less pubescent outside, the outer orbicular or obovate with undulate erose edges, slightly narrowed at the base, (oblong in var. *Kurzii*); inner shorter, the outer very pubescent inside, vaulted, ovate or cordate with a long linear claw. *Anthers* numerous, short, with broad flat smooth tops. *Ovaries* gradually narrowed into the short style; ovules 4; stigma sub-capitate-discoïd. *Ripe carpels* broadly ovoid, blunt at each end, densely tomentose, 1 in. long, and .75 in. in diam.: their stalks stout, .75 in. *Seeds* 4, compressed. *M. Teysmannii*, Scheff. in *Flora* LII (1869), 302. *Uvaria obtusa* (not of

Blume), Hook. fl. and Thoms., Fl. Ind. 113; Hook. fl. Fl. Br. Ind. I, 76; Wall. Cat. 6484.

Penang; Wallich, Curtis. Pangkore; Curtis. Malacca; Maingay, (Kew Distrib.) No. 65. Perak: King's Collector, Scortechini, Wray. Burma, Kurz. Distrib. Java.

Var. *Kurzii*, Leaves oblong-lanceolate, acuminate to elliptic: peduncles of racemes woody, 1 in. or more long, tomentose; outer petals narrowly oblong. *M. vandaeiflora*, Kurz F. Flora Burma I, 45.

Burma; Kurz, Brandis.

Allied to the Cambodian species *M. Thorellii*, (Pierre Fl. Forest. Cochin-Chine, t. 37).

2. MITREPHORA RETICULATA, Hook. fl. and Thoms. Fl. Br. Ind. I, 77. A tree 20 to 30 feet high: young branches tawny-tomentose, ultimately glabrous and dark-coloured. *Leaves* narrowly oblong, often slightly obovate, acuminate, the base cuneate or rounded; both surfaces shining, reticulate, glabrous; the midrib puberulous on the upper, sparsely setose on the lower, surface; main nerves 12 to 14 pairs, spreading, prominent, distinct beneath; length 5 to 14 in., breadth 2 to 4.5 in.; petiole .25 in., swollen. *Flowers* .2 in. in diam., axillary, solitary or in pairs, or in few-flowered, puberulous cymes; pedicels long, slender, with many lanceolate bracteoles. *Flowers* as in *M. macrophylla*, monœcious. *Ripe carpels* ovoid, apiculate, rugose, hoary, .8 in. long and .65 in diam. *Seeds* 2.

Kurz F. Flora Burma, I, 44. *Orophea reticulata*, Miq. Ann. Mus. Lugd. Bat. II, 23. *Uvaria reticulata*, Blume Fl. Jav. Anon. 50, t. 20. *Pseuduvaria reticulata*, Miq. Fl. Ind. Bat. i. pt. 2, 30.

Burma: prov. Tenasserim; Helfer. Malacca; Maingay (Kew Distrib.), No. 64. Perak: Wray, King's Collector, Scortechini; not so common as *M. macrophylla*, Oliver.

This species has the inner petals rather larger than the outer and much vaulted; and in this respect it conforms to the characters of *Orophea*; but its stamens are unvarioid in character and they are numerous; its flowers, moreover, are unisexual. The characters of *Mitrephora* therefore preponderate, and it is better located in the latter genus. But there is no doubt it forms a connecting link between the two genera.

3. MITREPHORA MACROPHYLLA, Oliver in Hook., Ic. Plant, t. 1562. A small tree; young branches more or less puberulous, speedily becoming glabrous and cinereous. *Leaves* thinly coriaceous, elliptic-obovate or oblong-oblancheolate, acute or shortly acuminate; the base rounded, slightly oblique; both surfaces puberulous at first but speedily glabrous, shining, minutely reticulate; main nerves 14 to 20 pairs, oblique, inter-arching .15 in. from the margin, prominent beneath; length 7 to 13

in., breadth 1·75 to 4 in.; petiole ·25 in., swollen. *Flowers* ·25 to ·3 in. in diam., axillary, usually in pairs, or in cymes, 1 to 2 in. long, the cymes minutely pubescent; bracts few, lanceolate; pedicels long, with several broadly lanceolate, partly deciduous bracteoles, or ebracteolate. *Sepals* free, or connate below, reniform, or broadly ovate, puberulous outside and on the edges, glabrous inside. *Outer petals* larger than the sepals, orbicular-ovoid, sub-acute, slightly narrowed at the base, puberulous on both surfaces. ·15 in. long. *Inner petals* ·3 in. long, thick, vaulted reniform-sagittate, puberulous, with a glabrous callosity on the inside near the base, the edges pubescent; the claw shorter than the limb, pubescent. *Male flower*: *stamens* very numerous, short, connate; the connective truncate, small and not concealing the tops of the anthers; pistils 3, or a few rudimentary. *Female flower*; *staminodes* in two imperfect rows. *Ovaries* about 12, ovoid-cylindric, oblique, pubescent, 4-ovuled; stigmas sessile, large, fleshy, truncate, often oblique. *Ripe carpels* globose, densely and minutely tawny-tomentose, ·4 or ·5 in diam.; stalks ·2 in. long. *Seeds* several, compressed, the testa membranous.

Penang; Maingay, Curtis. Perak; Scortechini, King's Collector, Wray.

This species, although rare in Penang, is very common in Perak. Specimens of it vary considerably in several respects. In some plants the young shoots are densely puberulous, in others they are almost glabrous; the leaves also vary in size and in amount of pubescence. In the specimen figured by Professor Oliver (Hook. Ic. Pl. 1562), the flowers are in axillary pairs; but, in the majority of the Perak specimens, they are in cymes. The species is practically dioecious, the staminate flowers having no ovaries at all or only a few rudiments; while the pistillate flowers have rarely a few perfect stamens, and not always any staminodes. The best marks of distinction between this and *M. reticulata*, of which this must be a very close ally, are the smaller number of the nerves in the leaves of this and the ovoid shape of its rugose fruit. In its leaves this plant somewhat resembles some of the species of *Popowia*. And, inasmuch as its inner petals are larger than the outer and are vaulted, it is related to *Orophea*, from which however its numerous univarioid stamens and unisexual habit exclude it.

4. MITREPHORA PRAINII, King, n. sp. A tree 30 to 40 feet high; young branches tawny-pubescent, speedily becoming glabrous and dark-coloured. *Leaves* membranous, elliptic-oblong, rather abruptly and shortly acuminate, the base connate and often slightly unequal-sided; upper surface glabrous except the depressed, strigulose midrib; lower surface much reticulate, glabrous but with a few scattered hairs on the

midrib and 12 to 14 pairs of rather bold, oblique, curving nerves; length 6 to 9 in., breadth 2.25 to 3 in., petiole .25 in., pubescent. *Flowers* bisexual, from the axis of the fallen leaves, solitary, .4 in. in diam.; pedicels about .5 in. long, softly tomentose, minutely bracteolate at the base. *Sepals* broadly ovate, acute, concave, tomentose outside, glabrous inside. *Outer petals* much larger than the sepals, ovate-orbicular, sub-acute; tomentose outside, glabrous inside. *Inner petals* longer but narrower than the outer; the limb trapezoid, densely tomentose, glabrous inside at the base; the claw narrow, about as long as the limb, tomentose on both surfaces. *Stamens* in the male flower numerous, short, euncate; the apical process of the connective truncate, concealing the apices of the dorsal anthers. *Pistils* 0. *Female flowers* unknown. *Ripe carpels* sub-globose, rather truncate at base and apex, rugulose, minutely pubescent, .65 in. in diam. *Seeds* about 5, plano-convex, the testa membranous, rugulose.

Andaman Islands; Prain, King's Collector.

The inner petals of this species are undoubtedly longer than the outer; but they are much narrower. Technically they are the petals of *Orophea* rather than of *Mitrephora*; but the numerous Uvarioid stamens and the unisexual habit are those of the latter, to which I accordingly refer it. I have been able to examine only a few flowers of the species, and these are all tetramerous; but whether this arrangement is normal or only occasional I am unable to say until larger suites of specimens are obtained.

17. *POPOWIA*, Endl.

Trees. *Flowers* small, sub-globular, opening but slightly, usually hermaphrodite, sometimes polygamous, extra-axillary or leaf-opposed. *Sepals* 3, ovate, valvate. *Petals* 6, valvate in 2-series, (the inner series imbricate in *Kurzii*), more or less orbicular; outer like the sepals, spreading; inner thick, concave, connivent, acute, the tip sometimes inflexed. *Stamens* indefinite or sub-definite, short, euncate; anther-cells dorsal, remote. *Carpels* about 6, ovoid; style large, oblong or sub-clavate, straight or recurved; ovules 1-2 on the ventral suture, rarely 1, basal, erect. *Ripe carpels* berried, globose or ovoid, stalked.—*DISTRIB.* About 20 Asiatic species, 12 Australian and 1 African. (The Australian and African species may be generically separable).

There has been considerable variety of opinion as to the place of the genus *Popowia* amongst the genera of *Anonaceae*. The genus was founded by Endlicher (Genus No. 4710) to accommodate the species named *Bocagea pisocarpa* by Blume (Flora Javae (*Anonaceae*) 90, t. 45).

Endlicher placed it next to *Orophea* from which it is distinguished by its inner row of petals being free and having their apices inflexed in æstivation, while those of *Orophea* are clawed, vaulted, attached by their edges, and not inflexed in æstivation. In their *Flora Indica*, Hooker filius and Thomson added the species *P. ramosissima* to the original plant of Endlicher, with a remark to the effect that *Uvaria Vogelii* H. f. should be included in the genus. Farther they associated *Popowia* with the genera *Orophea*, *Mitrephora* and *Goniothalamus* in the tribe *Mitrephoreæ*. In their *Genera Plantarum*, Mr. Bentham and Sir Joseph Hooker take a different view of the position of *Popowia* and, in the arrangement adopted in that great work, *Popowia* is put amongst the *Unoneæ*; *Orophea* is relegated to the tribe *Miliuseæ*; while *Goniothalamus* and *Mitrephora* are retained side by side in the tribe *Mitrephoreæ*. Now the character of the tribe *Unoneæ* is:—"petals flat, slightly unequal, or those of the inner row smaller than those of the outer, or absent," while in several of the *Popowias*, e. g., *P. pisocarpa*, *P. ramosissima* the inner petals are longer than the outer. Baillon, whose arrangement of tribes differs from that of Messrs. Bentham and Hooker, puts *Popowia* into *Unoneæ*, leaving *Mitrephora* and *Orophea* side by side in his tribe *Oxymitreeæ*.

Dr. Scheffer differs from the opinion of the authors of the *Genera Plantarum* and of Baillon and rather inclines to that of the authors of the *Flora Indica*. He points out with much force that the proper place for *Popowia* is in the tribe characterised by its "outer petals being open, the inner connivent over the andro-gynœcium, erecto-connivent or connate"—that is to say in the tribe *Mitrephoreæ* of these authors. The stamens of *Popowia* present considerable diversity, but on the whole they have the character of those of *Uvaria* rather than those of *Unoneæ*. As Scheffer remarks, there is little difference between the genera *Orophea* and *Mitrephora* except that the outer petals of *Mitrephora* are usually larger than those of *Orophea*. And if M. Baillon's plan of reducing the number of the genera in *Anonaceæ* were to be carried out, Dr. Scheffer would suggest the union of these two and of *Popowia* into a single genus, from which would be excluded, however, all the African species. Of this new genus *Orophea* would be the typical form, and the other two would form sub-genera.

There is no doubt than in externals many *Popowias* are like *Oropheas*, and the non-unguiculate character of the inner petals of *Popowia* is really the chief character which separates them.

I venture to follow Dr. Scheffer and the authors of the *Flora Indica* in putting *Popowia*, *Orophea* and *Mitrephora* together in the tribe *Mitrephoreæ*.

Flowers hermaphrodite.

Both surfaces of leaves glabrous except the nerves.

Both surfaces minutely granular; nerves

9 or 10 pairs, sparsely pilose beneath ... 1. *P. pauciflora.*

Lower surface granular, the midrib and

6 to 8 pairs of nerves pubescent ... 2. *P. ramosissima.*

Both surfaces shining, reticulate, glabrous

except the tomentose midrib on the

upper; nerves about 10 pairs, very faint 3. *P. nitida.*

Upper surface of leaves glabrous, the lower

minutely granular and sub-strigose; nerves

4 or 5 pairs ... 4. *P. Helferii.*

Upper surface of leaves glabrous except the

puberulous midrib, the lower yellowish-to-

tomentose; nerves 11 to 13 pairs; fruit very

large ... 5. *P. foetida.*

Upper surface of leaves glabrous except the

tomentose midrib and 8 to 10 pairs of nerves;

lower surface pubescent and sub-granular ...

6. *P. perakensis.*

Both surfaces minutely granular; upper short-

ly puberulous, lower pubescent; nerves 8 to

11 pairs ... 7. *P. fusca.*

Both surfaces minutely granular; upper with

a few scattered hairs; lower fuscous, densely

and softly pubescent; the nerves 6 or 7

pairs, tomentose or pubescent ... 8. *P. velutina.*

Both surfaces, but especially the lower, softly

pubescent; nerves about 10 pairs ...

9. *P. tomentosa.*

Flowers polygamous.

Upper surface of leaves glabrous except the

puberulous midrib; nerves 10 or 11 pairs;

flowers .5 to .75 in. in diam.; petals of inner

row larger than those of outer, valvate, their

apices inflexed in bud ... 10. *P. nervifolia.*

Upper surface of leaves sub-granular, minutely

and sparsely adpressed-pubescent; nerves 9

to 12 pairs; flowers .4 in. in diam.; inner

petals slightly smaller than the outer, im-

bricate ... 11. *P. Kurzii.*

Both surfaces of leaves glabrous, the lower

silvery, shining; nerves 7 pairs ...

12. *P. Hookeri.*

1. *POPOWIA PAUCIFLORA*, Maingay MSS. Hook. fil. Fl. Ind. I, 69. A tree? Young branches slender, cinereous, strigose. *Leaves* membranous, elliptic-lanceolate, acuminate, the base acute; both surfaces glabrous, minutely granular; the midrib and 9 or 10 pairs of oblique, little curving main nerves sparsely pilose beneath; length 5 to 6 in., breadth 1·5 to 2 in., petiole ·2 in., pubescent. *Flowers* extra-axillary, solitary or axillary, ·25 in. in diam.; pedicels ·15 to ·25 in. long, with a basal bracteole, rusty-strigose. *Sepals* minute, ovate. *Petals*; the outer small and like the sepals; the inner three times as large, sub-orbicular, concave, their apices inflexed. *Stamens* many. *Ovaries* about 6, strigose; ovule solitary, erect. *Ripe carpels* sub-sessile, globular, glabrous.

Malacca: Maingay (Kew Distrib.) No. 56.

Known only by Maingay's imperfect specimens; an obscure species.

2. *POPOWIA RAMOSISSIMA*, Hook. fil. and Thoms. Fl. Ind. 105. A small spreading tree; young branches at first rufous-pubescent; the older dark-coloured and furrowed. *Leaves* membranous, sub-sessile, narrowly elliptic to lanceolate, sometimes slightly obovate, shortly, bluntly and abruptly acuminate, the base rounded or slightly narrowed; both surfaces glabrous, the lower granular and pubescent on the midrib and 6 to 8 pairs of ascending rather straight nerves; length 2·75 to 4 in., breadth 1 to 1·75 in., petiole ·05 in. *Flowers* globular in bud, leaf-opposed, solitary or in small fascicles, ·2 in. in diam.; pedicels ·15 to ·25 in. long (longer in fruit), minutely bracteolate, rufous-tomentose. *Sepals* broadly triangular-ovate, acute, nearly as large as the outer petals and like them tomentose outside, and glabrous inside. *Petals* sub-equal, coriaceous, rotund, concave; the inner rather larger and with incurved points. *Stamens* short, with very broad truncate concave heads. *Ovaries* 5 or 6, villous; ovules 1 or 2. *Ripe carpels* globose with short stalks, pubescent, ·25 to ·35 in. in diam. Miq. Fl. Ind. Bat. I, Pt. 2, 27; Hook. fil. Fl. Br. Ind. I, 68. *Guatteria ramosissima*, Wall. Cat. 7294, 8006. *Popowia rufula* and *P. affinis* Miq. Ann. Mus. Lugd. Bat. II, 20.

In all the provinces, common. Distrib. Sumatra, Borneo.

3. *POPOWIA NITIDA*, King, n. sp. A shrub? Young branches sparsely and softly rufous-pubescent, the bark brown. *Leaves* thinly coriaceous, oblong-lanceolate to oblong-ovate, bluntly acuminate, the base rounded; both surfaces reticulate, glabrous and shining, the midrib tomentose on the upper; main nerves about 12 pairs, very faint, spreading and forming double arches inside the edge; length 2·5 to 4 in., breadth ·6 to 1·25 in., petiole ·1 in. *Flowers* few, in short extra-axillary racemes, sub-globular, ·25 in. in diam.; pedicels about as long as the flowers, each with 2 sub-orbicular, stem-clasping, pubescent bracteoles. *Sepals* orbicular, concave, puberulous on both surfaces, about ·15 in. in

diam. *Petals* sub-equal, about twice as large as the sepals, orbicular-ovate, sub-acute, cordate at the base, the edges incurved. *Stamens* about 27, in three rows; anther-cells linear, lateral, the apical process of the connective obliquely truncate, papillose. *Pistils* numerous, forming a large mass with their stigmas agglutinated. *Ovaries* sub-cuneate, pubescent especially near the truncate apex; stigma very large and viscous, sessile; ovules 1 to 3, ascending. *Ripe carpels* ovoid, pointed, glabrous, .4 to .5 in. long. *Seeds* 1 to 3, compressed, the testa pale brown, shining.

S. Andaman: King. Nicobars: Kurz.

In its leaves this much resembles *Uvaria micrantha*, H. f. and T. as which I have reason to believe some specimens of this have been distributed from the Calcutta Herbarium.

4. *POPOWIA HELFERI*, Hook. fil. and Thoms. Fl. Ind. I, 69. A small spreading tree; young branches coarsely hairy. *Leaves* membranous, lanceolate or oblong-lanceolate, acuminate, the base narrowed but rounded; upper surface glabrous; the lower granular, sub-strigose, especially on the midrib; main nerves indistinct, about 4 or 5 pairs, ascending; length 2 to 4 in., breadth .8 to 1.25 in., petiole .05 in. *Flowers* minute, globose, extra-axillary: peduncles .05 to .2 in., tomentose. *Sepals* ovate, strigose. *Outer petals* like the sepals, the inner orbicular, larger than the outer, concave, very strigose, their apices inflexed. *Stamens* 15. *Ovule* solitary. *Carpels* about 6, globular, strigose. Kurz. F. Flora Burm. I, 39.

Andamans; North of Port Mouat; Kurz. Burmah: Tenasserim, on King's Island; Helfer.

A very little known species closely resembling *P. Beddomiana*, H. f. and Th.

5. *POPOWIA FETIDA*, Maingay MSS., Hook. fil. Fl. Br. Ind. I, 69. A large tree; young branches tawny-tomentose. *Leaves* sub-coriaceous, elliptic-lanceolate, shortly caudate-acuminate, the base sub-acute; upper surface glabrous except the puberulous midrib, lower densely covered with yellowish-grey tomentum as are the petioles; main nerves 11 to 18 pairs, rather prominent beneath, curved, spreading, inter-arching close to the margin; length 4.5 to 6.5 in., breadth 1.6 to 2 in., petiole .2 in. *Flowers* solitary, .35 in. in diam.; pedicels .2 in., tomentose. *Sepals* minute, ovate, obtuse. *Petals* unequal, the outer ovate-elliptic, obtuse, yellow; the inner slightly larger, apiculate, concave, the margins thick. *Stamens* about 30, the connective large. *Ovaries* about 6, strigose, 2-ovuled. *Ripe carpels* few, very large, oblong-ovoid, obtuse, sessile, densely and shortly yellowish-tomentose, 2.25 in. long, and 1.5 in. in diam. *Seed* solitary, oblong, the testa bony.

Malacca; Maingay, (Kew Distrib.) No. 55.

6. *POPOWIA PERAKENSIS*, King, n. sp. A shrub 6 to 15 feet high; young branches densely and minutely dull rusty-tomentose, the older dark and furrowed. *Leaves* elliptic to oblong-elliptic, very shortly and rather abruptly acuminate, the base slightly narrowed, sometimes sub-oblique; upper surface glabrous, the midrib and nerves tomentose; lower pubescent, sub-granular: main nerves 8 to 10 pairs, spreading, slightly prominent beneath; length 4 to 5·5 in., breadth 2 to 2·5 in.; petiole ·1 in., tomentose. *Flowers* extra-axillary, usually in pairs (but not contemporaneous) ·3 in. in diam.; pedicels ·4 in. long, ferruginous-tomentose, minutely bracteolate. *Sepals* smaller than the petals, semi-orbicular, acute, coarsely tomentose outside, sub-glabrous inside. *Petals* thick, ovoid-orbicular, sub-acute, sub-concave, densely whitish-sericeous outside, glabrous within; the inner row slightly larger than the outer, neither their edges nor apices incurved. *Stamens* numerous, flattened, with truncate, corrugated heads. *Ovaries* about 10, thin, glabrous, except a few long hairs near the base, 2-ovuled: stigmas large, rounded. *Ripe carpels* few, ovoid, with sub-truncate apices, slightly narrowed to the stalks, glabrous or sparsely pubescent, with several horizontal constrictions when ripe ·5 in. long and ·25 in. in diam.; stalks ·25 to ·5 in. long. *Seeds* 2, superposed, plano-convex.

This resembles *P. ramosissima* in its leaves but has much larger flowers of which the inner petals are not inflexed and the carpels have 2 seeds.

Perak: King's Collector, Wray; from 200 to 2,500 feet.

7. *POPOWIA FUSCA*, King, n. sp. A tree 40 to 50 feet high; young branches densely covered with purplish-brown tomentum; the older cinerous, sub-pubescent and much furrowed. *Leaves* coriaceous, oval-oblong, obtuse or sub-acute, the base rounded; both surfaces minutely granular, the upper shortly puberulous, the lower pubescent, the midrib and 8 to 11 pairs of spreading, rather prominent main nerves tomentose on both; length 2·5 to 3·5 in., breadth 1·4 to 1·8 in.; petiole ·2 in. purplish-tomentose like the flower pedicels. *Flowers* in small extra-axillary fascicles from small bracteate tubercles, 25 in. in diam.; pedicels ·15 to ·25 in. *Sepals* ovate-obtuse, tomentose outside, glabrous inside. *Petals* sub-equal, rotund, very thick and fleshy, tomentose outside, puberulous inside. *Ripe carpels* few, globular, densely tomentose, ·25 in. in diam.; stalks ·1 to ·2 in. long, tomentose. *Seeds* solitary.

Perak, near Ulu Kerling, at an elevation of 500 feet, King's Collector, No. 8602.

This much resembles *P. velutina*, King, but its leaves are more oval, have more nerves, and are not so pubescent.

8. *POPOWIA VELUTINA*, King, n. sp. A tree 20 to 40 feet high;

young branches covered with minute soft deep brown tomentum. *Leaves* elliptic-oblong, to ovate-elliptic, acute or shortly and narrowly acuminate, slightly narrowed to the rounded sub-unequal base; both surfaces minutely granular, the upper with a few scattered hairs; the lower fuscous and more densely and softly pubescent, both the midrib and nerves tomentose or pubescent; main nerves 6 or 7 pairs, spreading, indistinct; length 3 to 5 in., breadth 1·4 to 1·8 in., petiole ·1 in. *Flowers* solitary or in pairs, extra-axillary, about ·25 in. in diam., pedicels densely tomentose, ·35 in. long, bracteolate. *Sepals* broadly ovate, sub-acute, densely tomentose outside, glabrous inside, persistent in the fruit. *Petals* sub-equal, thick, sub-orbicular, very tomentose outside, glabrous inside. *Ripe carpels* few, sometimes solitary, ovoid, blunt, slightly oblique at the base and slightly narrowed to the stalk, minutely velvety-pubescent, ·5 in. long and ·35 in. in diam.; stalks ·2 in., tomentose; torus small. *Seal* solitary, glabrous, rugose, vertically furrowed.

Perak, at Kinta; at elevations under 1,000 feet; King's Collector.

A species very like *P. fusca*, but with shorter, fewer-nerved leaves; evidently not common. None of the collectors' specimens have fully developed flowers, and the foregoing description of these is taken from a bud.

9. *POPOWIA TOMENTOSA*, Maingay MSS. Hook. fil. Fl. Br. Ind. I, 70. A tree; young branches softly rusty-tomentose, when older black and rugose. *Leaves* elliptic-oblong to elliptic, acute or shortly acuminate, the base rounded, slightly unequal-sided; both surfaces, but especially the lower, softly pubescent; main nerves about 10 pairs, slightly prominent, spreading; length 4·5 to 5·5 in., breadth 1·75 to 3 in.; petiole ·1 in., tomentose. *Flowers* extra-axillary, sub-sessile, ·25 in. in diam. *Sepals* broadly ovate, connate, slightly smaller than the petals. *Petals* slightly unequal, villous outside, glabrous inside; the outer ovate, thick; the inner larger, very thick and concave, oblong, connivent. *Stamens* about 25. *Ovaries* 7 to 9, oblong, pubescent; ovules 2. *Ripe carpels* globose, slightly pubescent, ·5 to ·74 in. in diam., 2-seeded; their stalks ·35 in., pubescent.

Malacca; Maingay, (Kew Distrib.) No. 54. Penang: Curtis, No. 648. Perak; Scortechini.

I am not satisfied that there are not two species involved here, the one with broader leaves and shorter pubescence.

10. *POPOWIA NERVIFOLIA*, Maingay MSS. ex Hook. fil. Fl. Br. Ind. I, 60. A small tree 12 to 25 feet high: young branches at first densely rusty-tomentose, afterwards dark-coloured and furrowed. *Leaves* coriaceous, from oblong-lanceolate or ob-lanceolate to elliptic-oblong, shortly abruptly and bluntly acuminate, the base acute; upper surface shining,

glabrous except the puberulous midrib; lower paler, sparsely rusty-pubescent; main nerves 10 or 11 pairs, oblique, rather prominent on the lower surface; length 5·5 to 8·5 in., breadth 1·8 to 3 in.; petiole ·35 to ·5 in., rusty-pubescent. *Flowers* polygamous, extra-axillary, solitary or 2 or 3 together, sub-globose, from ·5 to ·75 in. in diam.; pedicels, stout, tomentose, ·15 to ·25 long, with 2 bracts nearly as large as the sepals. *Sepals* ovate-orbicular, acute, slightly smaller than the outer petals, very thick, villous-tomentose outside and glabrous inside as are all the petals: inner petals larger than the outer, their apices much inflexed in bud. *Stamens* numerous, with flat, rhomboid heads. *Ovaries* numerous, hirsute. *Carpels* numerous, cylindric-ovoid, apiculate, narrowed to the stalk, sparsely strigose, ·5 in. long and ·25 in. in diam.; stalks ·2 to ·3 in. long, strigose-pubescent; torus globular, ·4 in. in diam. *Seed* pale, shining.

Malacca: Maingay (Kew Distrib.,) No. 53. Perak: common at low elevations.

Allied to *P. Kurzii*, but with larger flowers which have their inner petals valvate with much inflexed edges.

11. *POPOWIA KURZII*, King. A shrub or small tree; young branches at first tawny-pubescent, afterwards dark-coloured, glabrous and furrowed. *Leaves* sub-coriaceous, oblong-lanceolate, or elliptic-oblong sub-acute or shortly and bluntly acuminate, narrowed to the sub-cuneate (sometimes almost rounded) base; upper surface sub-granular, minutely and sparsely adpressed-pubescent; lower sparsely pubescent; main nerves 9 to 12 pairs, oblique, inter-arching close to the edge, rather prominent beneath; length 5 to 9 in., breadth 1·5 to 3 in.; petiole ·2 to ·25 in., tomentose. *Flowers* polygamous, solitary, or in pairs, sub-sessile, extra-axillary, sub-globose, ·4 in. in diam.; pedicels tomentose, ·1 to ·2 in. long, bracteolate. *Sepals* smaller than the petals, valvate, semi-orbicular, and, like the petals, tomentose externally and glabrous internally. *Petals* sub-equal, concave, the outer ovate-orbicular, valvate; the inner slightly smaller than the outer, imbricate. *Stamens* numerous, flattened, elongate, with linear, lateral anther-cells and flat, oblique, rhomboid apices. *Ovaries* (often absent) about 10, elongate, pubescent, the stigmas clavate. *Fruit* unknown. *Polyalthia macrophylla*, Hook. fil. and Thoms. Fl. Br. Ind. I, 63. *P. dubia* Kurz F. Flora Burma, I, 38. *Gutteria macrophylla*, Blume Bijdr. 19; Fl. Javae Anon. 96. t. 97; Miq. Fl. Ind. Bat. I, Pt. 2, 47.

South Andaman; Kurz, King's Collector. Burmah; province Tenasserim; Falconer, Kurz.

This species appears to be practically dioecious. In its flowers the inner petals are distinctly imbricate; they are not connivent, and

their points are not inflexed. And in these respects they do not answer to the diagnosis of *Popowia* as heretofore understood. I have therefore ventured to modify the generic character of *Popowia* in these points, and to institute a section of it to receive this and other two species. This species is closely allied to the plant originally described and figured by Blume as *Guatteria macrophylla*, (Fl. Jav. Anon. 96 t. 47,) and to receive which Miquel founded his genus *Trivalvaria* (Ann. Mus. Lugd. Bat. II, 19). But, in Blume's and Miquel's plant, the inner petals are distinctly valvate, although their apices are not inflexed. And in the non-inflexion of its petals it also does not conform to the character of *Popowia* as originally defined by its founder Endlicher.

12. *POPOWIA HOOKERI*, King. A shrub; young branches dark-coloured, glabrous. *Leaves* thinly coriaceous, broadly lanceolate or oblanceolate, acute or acuminate, the base acute: both surfaces glabrous, the lower silvery, shining: main nerves about 7 pairs, spreading, ascending, curving, rather prominent beneath, evanescent at the tips; length 5.5 to 7 in., breadth 1.6 to 2.4 in. *Flowers* solitary or in fascicles of 2 or 3 from short extra-axillary, woody tubercles, polygamous, minute; "the males as in *Popowia Kurzii* but smaller; the females with many, densely pubescent ovaries and a few imperfect stamens; bracts many, minute, strigose. *Carpels* many, .75 in. long, oblong, granulate, glabrous; stalk .35 in." *Guatteria pallida*, H. f. and Th. Fl. Ind., 143 (not of Blume). *Polyalthia argentea*, Hook. fil. and Thoms. Fl. Br. Ind. I, 67.

Assam and Sylhet; in dense forests, Hook. fil. and Thomson; Naga Hills, Masters. Khasia: Griffith.

A species of which I have seen only imperfect specimens. The description given above of the flowers is copied from Sir Joseph Hooker. In my opinion the plant is a *Popowia* rather than a *Polyalthia* and to the former genus I have ventured to remove it.

Doubtful Species.

Popowia parvifolia, Kurz in Journ. of Botany for 1875, p. 324. Of this I have seen only leaf specimens with a few detached fruits. It appears to have also had the MSS. name *P. nitida* given to it by Kurz.

18. *OXYMITRA*, Blume.

Climbing shrubs. *Leaves* parallel-nerved; nervules transverse, not forming intra-marginal loops. *Flowers* leaf-opposed or extra-axillary. *Sepals* 3, valvate, connate below. *Petals* 6, valvate, in 2 rows, outer large, long, flat or triquetrous and narrow, leathery, more or less spreading or connivent; inner much smaller, ovate-lanceolate or oblong (long and narrow in *O. filipes* and *O. glauca*), conniving over the stamens and

ovaries. *Stamens* many, linear-oblong or cuneate, truncate; anther-cells dorsal, remote (small and ovoid in *O. glauca*). *Ovaries* oblong, strigose; style oblong or clavate, recurved; ovules 1-2, sub-basal, ascending. *Ripe carpels* 1-seeded, stalked.—*Distrib.* About 28 species, Asiatic and African.

A genus of which the flowers have some resemblance to those of *Goniothalamus*: but in this the inner petals are not contracted into a claw as in *Goniothalamus* and the calyx in this is smaller and not persistent.

Outer petals flat 1. *O. affinis*.

Outer petals concave.

Pedicels slender, much longer than the flowers 2. *O. filipes*.

Pedicels shorter than the flowers.

Leaves oblong-elliptic, more or less obovate,
blunt 3. *O. calycina*.

Leaves oblong-elliptic to oblong-lanceolate
or elliptic-lanceolate, not obovate, acute,
or acuminate.

Outer petals expanded and concave in
the lower third; the inner only one
fourth as long as the outer, very
acuminate 4. *O. biglandulosa*.

Outer petals narrowly linear-lanceolate,
slightly expanded and concave
at the very base 5. *O. glauca*.

1. OXYMITRA AFFINIS, Hook. fil. and Thoms. Fl. Br. Ind. I, 70. A spreading shrub or climber: young branches at first densely rusty tomentose, afterwards dark-coloured and glabrous. *Leaves* membranous, elliptic to oblong-elliptic, sometimes slightly obovate, acute or very shortly acuminate, rarely obtuse, the base rounded or slightly narrowed; upper surface shining, minutely scaly, glabrous except the pubescent midrib; under surface slightly glaucous, pubescent especially on the midrib and nerves; main nerves 8 to 14 pairs, spreading, ascending, rather prominent on the lower surface; length 3.5 to 10 in., breadth 1.25 to 4.5 in.; petiole .3 in., tomentose. *Flowers* solitary, extra-axillary; pedicels .25 to .4 in. *Sepals* slightly connate at the base, spreading, broadly ovate or orbicular-ovate, sub-acute, 3- to 7-nerved, adpressed-pubescent, .5 in. long and slightly narrower than the base of the petals, persistent in the fruit. *Petals* flat, very unequal; the outer thinly coriaceous, oblong-lanceolate, sub-acute, the midrib thick and with several strong sub-parallel nerves, adpressed-pubescent on both surfaces, 1.5 to 1.75 in. long and .4 to .6 in. broad; inner petals thickly coria-

ceous, ovate, sub-acute, '5 in. long, pubescent outside, glabrous inside. *Ripe carpels* cylindric, blunt at each end, pubescent, '5 to '8 in. long and '3 in. in diam. : stalks pubescent, '2 in. long. *Seed* solitary.

Malacca ; Maingay, (Kew Distrib.) No. 39. Perak ; King's Collector, Scortechini. Distrib., Siam.

2. OXYMITRA FILIPES, H. f. and Th. Fl. Br. Ind. I, 71. A climber : young branches softly brown-tomentose, dark-coloured and lenticellate when old. *Leaves* membranous, oblong-lanceolate or oblong-elliptic, often slightly obovate, acute or shortly acuminate, slightly narrowed to the sub-cordate sometimes slightly oblique base ; upper surface glabrous, minutely scaly, sometimes pubescent, the midrib and nerves always so ; under surface paler, sub-glaucous, pubescent, the midrib tomentose ; main nerves 12 to 14 pairs, spreading, prominent beneath ; secondary nerves obliquely transverse, prominent : length 4'5 to 7'5 in., breadth 1'4 to 2'5 in. ; petiole '2 to '25 in., tomentose. *Flowers* very long and narrow, often curved, 1'75 to 2'5 in. long, solitary on slender extra-axillary pedicels 3 or 4 in. long, which are pubescent and have a subulate bract near the middle. *Sepals* '25 in. long, spreading, ovate, acute, pubescent. *Petals* very unequal ; the outer fleshy, very narrow, triquetrous, expanded and concave at the base, pubescent ; the inner less than one fifth of the outer in length, lanceolate with caudate-acuminate apex, glabrous. *Stamens* numerous : ovaries 1-ovuled. *Ripe carpels* numerous, ovate-cylindric, shortly apiculate, softly pubescent, '5 in. long and '25 in. in diam. ; stalks '3 in. long, pubescent. *Seed* solitary, pale.

A species readily distinguished in this genus by the extreme length and narrowness of the outer petals. Evidently closely allied to *O. cuneiformis*, Miq. (*Polyalthia cuneiformis*, Bl. Fl. Javae Anon. 75 t. 35, 36d, 37), which it resembles in that respect as also in its filiform, elongated pedicels.

Malacca ; Maingay, (Kew Distrib.) No. 60. Perak : King's Collector.

3. OXYMITRA CALYCINA, King, n. sp. A slender, woody creeper ; young branches densely rusty tomentose. *Leaves* coriaceous, oblong and sub-acute or cuneiform-oblong, very blunt or even emarginate, always slightly narrowed to the rounded or minutely cordate base ; upper surface glabrous, shining, the midrib sometimes rufous-pubescent ; under surface pale, glaucous, pubescent especially on the midrib and nerves : main nerves 7 to 14 pairs, prominent on the under, impressed on the upper, surface, spreading ; the secondary nerves obliquely transverse, prominent : length 6 to 12 in., breadth 2'65 to 7'5 in., petiole '2 to '4 in., rufous tomentose. *Flowers* solitary, extra-axillary ; pedicels '3 to 1 in.,

rufous-tomentose, bearing two bracts, one small, the other large, obovate, ribbed. *Sepals* free, nearly half as long as the outer petals, elliptic, sub-acute; the edges undulate, rufous-tomentose on both surfaces. *Petals* thick, lanceolate, caudate-acuminate, the midrib prominent, the base concave, both rows glabrous inside, the outer about 1 to 1.25 in. long, tomentose outside; the inner about .5 in. shorter, connate into a narrow, acute cone, puberulous outside. *Ovaries* 1-ovuled. *Ripe carpels* elliptic, apiculate, pubescent, .35 in. long: stalks .2 in., pubescent.

This closely resembles *Oxymitra cuneiformis*, Miq. of which Blume (under the name of *Polyalthia cuneiformis*) gives an excellent description and three admirable figures (Fl. Javae Anon. 75 t. 35, 36D. and 37. But in Blume's plant the flowers are much larger, the petals are falcate, while the sepals are much smaller and have caudate apices: the pedicels too are much longer and have smaller bracteoles.

Perak: Ulu Bubong at elevations of 500 to 1,000 feet, King's Collector, No. 10604. Singapore: Ridley. Penang; Curtis.

4. OXYMITRA BIGLANDULOSA, Scheffer in Nat. Tijdsch. Ned. Ind. XXXI, 341. A creeper 50 to 100 feet long; young branches minutely rufous-sericeous, afterwards dark-coloured and glabrous. *Leaves* coriaceous, elliptic to elliptic-oblong, acute or shortly acuminate, the edges slightly recurved when dry, the base rounded or slightly cuneate; upper surface glabrous, the midrib puberulous; the lower paler, sub-glaucous, puberulous or glabrescent; main nerves 7 to 9 pairs, ascending, prominent beneath; length 3.5 to 7.5 in., breadth 2 to 3.5 in., petiole .2 to .4 in. *Flowers* shortly pedicelled, solitary, extra-axillary, 1 to 1.15 in. long: pedicels .4 in. long (elongating in fruit) angled, slender, with 1 subulate bracteole. *Sepals* fleshy, ovate, much acuminate, spreading or reflexed, adpressed, rusty-puberulous. *Petals* fleshy, yellow, very unequal: the outer lanceolate-oblong, obtuse, expanded and concave in the lower third, rusty adpressed-pubescent; the midrib prominent, sub-glabrous inside; the inner only as large as the sepals, with broad bases (cleft in the middle) and long acuminate points. *Ripe carpels* oblong-ovoid, blunt at each end or slightly apiculate at the apex, yellow when ripe, puberulous or glabrous, .75 in. long: stalks .5 in. *Polyalthia biglandulosa*, Hook. fil. Fl. Br. Ind. I, 65. *Guatteria biglandulosa*, Blume Fl. Javae Anon. 102, t. 51; Miq. Fl. Ind. Bat. I, Pt. 2, p. 48; Hook. fil. and Thoms. Fl. Ind. 143.

Malacca; Griffith, Maingay, (Kew Distrib.) No. 49. Selangor; Ridley. Perak, King's Collector. Distrib.: Malayan Archipelago.

The structure of the flowers of this species appears to me to be that of an *Oxymitra* rather than of a *Polyalthia* or *Guatteria*, and therefore I have transferred it to this genus.

5. *OXYMITRA GLAUCA*, H. f. and Th. Fl. Ind. 146; Hook. fil. Fl. Br. Ind. I, 71. A slender woody climber: young branches slightly tomentose, soon becoming glabrous. *Leaves* thinly coriaceous, elliptic, elliptic-lanceolate to lanceolate, obtuse, acute or shortly acuminate; the base rounded, sometimes slightly narrowed; upper surface glabrous, the midrib and sometimes the nerves pubescent; the lower very pale, glaucous, glabrous or sparsely puberulous, the midrib pubescent; main nerves 8 to 12 pairs, spreading, prominent beneath: length 4 to 6 in., breadth 1.5 to 2 in.; petiole .2 in., pubescent. *Flowers* solitary, extra-axillary, narrow and elongate; pedicels slender, .5 in. long, with a median subulate bract, longer in fruit. *Sepals* connate at the base, broadly ovate, much acuminate, adpressed-pubescent, .25 in., long. *Petals* very unequal: the outer thickly coriaceous, linear-lanceolate, sub-acute, slightly expanded and sub-concave at the base, outside minutely pubescent; inside glabrous, the midrib prominent: inner petals with sub-orbicular bases (cleft in the middle), and long acuminate points, glabrous, only about one-fifth as long as the outer. *Ovaries* hairy; ovule solitary. *Carpels* many, ovoid, slightly apiculate, .4 in. long and .25 in. in diam., minutely tomentose; stalks slender, .75 in. long. *Miq. Fl. Ind. Bat. I, Pt. 2, 50.*

Penang, Malacca: Maingay (Kew Distrib.) No. 58. Perak; common at low-elevations. *Distrib.*: Sumatra, Beccari, No. 626.

19. MELODORUM, Dunal.

Climbing shrubs. *Flowers* terminal, axillary and leaf-opposed, fascicled or paniced; buds triquetrous. *Sepals* 3, small, valvate, connate below. *Petals* 6, valvate, in 2 rows; outer plano-convex or trigonous: inner triquetrous above, hollowed below on the inner face. *Stamens* many; anther-cells dorsal, contiguous; top of connective more or less flattened, triangular, quadrate or orbicular. *Pistils* many, free; style oblong; ovules 2 or more. *Ripe carpels* berried.—*Distrib.*:—species about 35. Tropical Asia and Africa; Australia.

Section I. MELODORUM proper. *Outer petals* oblong-ovate; ovaries hairy, ovules usually more than 4. *Seeds* smooth (unknown in *M. litseaefolium*).

Flowers not more than .4 in. long (often .5 in. in *M. fulgens*), flower-buds broadly pyramidal.

Flowers .2 to .25 in. long, in few-flowered, lax, axillary racemes; leaves beneath hoary-pubescent with a superficial layer of flexuose hairs: ovules 4

1. *M. litseaefolium*.
Flowers .4 to .5 in. long; solitary, or in

- few-flowered terminal or leaf-opposed cymes; leaves beneath sparsely and minutely strigose: ovules 4 ... 2. *M. fulgens*.
- Flowers .5 in. or more in length (see also *M. fulgens*).
- Flower-buds broadly pyramidal.
- Flowers racemose, rarely solitary.
- Leaves glabrous above except the midrib, beneath densely golden-brown sericeous. Ripe carpels ovoid-globose, 1.25 in. long, their stalks 2 to 3 in. long ... 3. *M. manubriatum*.
- Flowers in axillary or terminal panicles. Leaves minutely pubescent above, softly brown-tomentose beneath: ripe carpels globose to ovoid, velvety-tomentose, 1 to 2.25 in. long; stalks .75 to 1.75 in. ... 4. *M. latifolium*.
- Flowers always solitary and axillary. Ripe carpels cylindric, sub-tubercular, 1 to 1.75 in. long ... 5. *M. cylindricum*.
- Flower-buds narrowly pyramidal, racemose or paniculate.
- Leaves glabrous above except the midrib, beneath glaucous hoary-puberulous. Ripe carpels globose or ovoid-globose, tubercled, 1 in. long, their stalks 1 in. ... 6. *M. hypoglaucum*.
- Leaves glabrescent or glabrous above, except the midrib; beneath softly rufous-pubescent. Ripe carpels globular, densely and minutely dark brown-tomentose, .8 in. in diam.; their stalks slightly longer ... 7. *M. parviflorum*.
- Leaves harshly pubescent above, uniformly and softly pubescent beneath. Ripe carpels globose, harshly and minutely pubescent, 1.1 in. in diam.; stalks slender, twice as long ... 8. *M. sphaerocarpum*.

Section II. PYRAMIDANTHE. Outer petals very long, linear-lanceolate, 1·2 to 5 in. long. *Flowers* solitary or in pairs, axillary, rarely leaf-opposed (cymose in *M. lanuginosum* and *M. rubiginosum*.)

Ovules more than 4.

Flowers 1·25 to 1·5 in. long; outer petals rufous-lanate externally; ripe carpels sub-globose, .79 in. in diam. ... 9. *M. lanuginosum*.

Flowers 1·25 to 1·5 in. long; outer petals minutely rufous-tomentose externally; ripe carpels oblong, tapering to both ends, 1·5 to 2 in. long ... 10. *M. Maingayi*.

Flowers 1·5 to 2 in. long; outer petals minutely rufous-tomentose outside; ripe carpels ovoid, tuberculate, 1·4 in. long ... 11. *M. prismaticum*.

Ovules 4.

Flowers 3 to 5 in. long; outer petals adpressed-puberulous externally ... 12. *M. macranthum*.

Section III. KENTIA. Outer petals not much longer than broad, broadly ovate or sub-orbicular, with broad thick margins: flowers axillary; ovaries glabrous, 2 to 8-ovuled: seeds pitted.

Ovules about 8: ripe carpels ovoid or ovoid-globose; leaves oblong-lanceolate ... 13. *M. elegans*.

Ovules 2; ripe carpels globular: leaves elliptic or elliptic-oblong, sometimes ob-ovate ... 14. *M. pisocarpum*.

1. MELODORUM LITSEÆFOLIUM, King, n. sp. A powerful climber: young branches densely but minutely rusty-tomentose, afterwards tuberculate and sub-glabrous. *Leaves* coriaceous, oblong-ovate to oblong, acute, the base rounded or slightly cuneate; upper surface greenish when dry, glabrous, shining except the rufous-pubescent midrib; lower reticulate; uniformly hoary-pubescent with a superficial layer of deciduous yellowish or reddish flexuose hairs; main nerves 8 to 10 pairs, oblique, curving, prominent beneath; length 2·75 to 4·25 in., breadth 1·35 to 1·6 in. *Flowers* .2 to .25 in. long, in few-flowered lax axillary rufous-tomentose racemes or in terminal panicles; pedicels .25 to .35 in. long with a single small median bracteole. *Sepals* broadly ovate-acute, concave, connate at the base, spreading, .1 in. long. *Petals* broadly ovate-oblong, acute, leathery; outer .3 in. long, slightly concave and glabrous at the base, otherwise puberulous inside, rufous-tomentose outside; the inner petals much smaller, hoary-puberulous except the pitted glabrous concavity at the base inside. *Stamens* numerous, apical process of the connective broadly and bluntly triangular;

filaments short. *Ovaries* few, oblong, oblique, rufous-pubescent, 4-ovuled; stigma lateral, oblong. *Ripe carpels* unknown.

Perak: King's Collector, Nos. 4063 and 4986.

The flowers of this resemble those of *M. fulgens*, H. f. and Th., but they are smaller and more numerous than those of *M. fulgens*; the petals of this species also are thinner and the apical process of the anthers is broader and blunter. The leaves too of this are broader and, in the indumentum on their lower surface, they differ considerably from those of *M. fulgens*. Fruit of this species is as yet unknown. The ovaries have only 4 ovules.

2. *MELODORUM FULGENS*, Hook. fil. Fl. Br. Ind. 120. A large climber; young branches minutely tawny-pubescent, speedily becoming glabrous and dark-coloured. *Leaves* oblong-lanceolate, acuminate, the base rounded or sub-acute; upper surface pale olivaceous when dry, glabrous, the midrib strigose; under surface brown when dry, sparsely and minutely strigose, especially on the midrib; main nerves 11 to 13 pairs, oblique, curving; length 3 to 4·5 in., breadth 1·2 to 1·5 in.; petiole ·25 to ·4 in. pubescent. *Flowers* ·4 to ·5 in. long, solitary or in terminal or leaf-opposed, few-flowered cymes: pedicels ·3 to ·4 in. long, adpressed tawny-pubescent with one sub-medial and one basal bracteole. *Sepals* broadly ovate, sub-acute, connate at the base, spreading, ·1 in. long, pubescent outside, glabrous inside. *Petals* thick; the outer flat, ovate-oblong, sub-acute, tawny-pubescent outside, glabrous at the base inside, ·5 in. long; inner petals like outer but concave at the base, only ·3 in. long and glabrous, except near the apex outside. *Stamens* numerous; apical process of connective of the outer lanceolate and as long as the anthers, that of the inner shorter. *Ovaries* narrowly oblong, oblique, curved, minutely pubescent, with 4 ovules in two rows: style lateral, half as long as the ovary, stigma small. *Ripe carpels* ovoid-globose densely and minutely silky tawny-tomentose like the stalks, 1 to 1·5 in. long, and ·9 in. in diam.; stalks ·85 to 1·5 in. long, stout. *Seeds* oblong, plano-convex, brown, shining. Hook. fil. Fl. Br. Ind. I, 82. Miq. Fl. Ind. Bat. I, Pt. 2, 35. *Uvaria fulgens* and *Myristica Finlaysonian*, Wall. Cat. 6482 and 6793.

Malacca, Perak, Singapore. Distrib. Borneo, Philippines.

3. *MELODORUM MANUBRIATUM*, Hook. fil. and Thoms. Fl. Ind. 118. A large creeper: young branches minutely rufous-pubescent. *Leaves* thinly coriaceous, oblong-lanceolate, acuminate, the base rounded or slightly narrowed; upper surface olivaceous when dry, glabrous, the midrib rufous-pubescent; lower uniformly covered with rather thin brown or golden sericeous tomentum; main nerves 12 to 18 pairs, oblique, slightly curved, rather prominent beneath; length 2 to 4·5 in.,

breadth $\cdot 75$ to $1\cdot 5$ in.; petiole $\cdot 3$ in., tomentose. *Flowers* $\cdot 6$ to $\cdot 75$ in. long, leaf-opposed or extra-axillary, in short racemes, rarely solitary; pedicels $\cdot 25$ to $\cdot 75$ in., softly pale rufous-tomentose, with one broad clasping bracteole near the base. *Sepals* broadly ovate, shortly sub-acuminate, spreading, connate at the base, sericeous outside, glabrous inside. *Petals* leathery, ovate-lanceolate, sub-acuminate, concave, the outer $\cdot 6$ to $\cdot 75$ in. long, outside sericeous, inside puberulous in the upper half, glabrous in the lower; the inner petals smaller, minutely pubescent in the upper half outside and near the apex inside, otherwise glabrous, the base very concave. *Stamens* numerous, the connective bluntly triangular at the apex. *Ovaries* numerous, oblong, densely sericeous; ovules 8 in 2 rows; stigma sessile, glabrous, bifid. *Ripe carpels* numerous, ovoid-globose, with thick pericarp, about $1\cdot 25$ in. long, densely rufous-tomentose; stalks 2 to 3 in. long. *Seeds* about 8, in two rows. Hook. fil. Fl. Br. Ind. I, 79; Miq. Fl. Ind. Bat. I, Pt. 2, 35. *Melodorum bancanum*, Scheff. Nat. Tijds. XXXI, 343. *Uvaria manubriata*, Wall. Cat. 6456.

Penang, Malacca, Singapore. Perak: very common. Distrib.: Bangka.

4. MELODORUM LATIFOLIUM, Hook. fil. and Thoms. Fl. Ind., 116. A large climber; young shoots velvety rufous-tomentose. *Leaves* coriaceous, oblong or narrowly elliptic, sub-acute or obtuse, the base rounded; upper surface minutely pubescent, the midrib tomentose; lower surface uniformly covered with short, soft, brown tomentum; main nerves 16 to 24 pairs, spreading, bold, not inter-arching: length 3 to $7\cdot 5$ in., breadth $1\cdot 75$ to $2\cdot 5$ in.; petiole $\cdot 4$ to $\cdot 7$ in., stout, channelled, tomentose. *Flowers* from $\cdot 6$ to $1\cdot 25$ in. in diam. when expanded, brown, in lax axillary or terminal racemes or panicles; pedicels $\cdot 35$ to $\cdot 5$ in. with bracteole at the base. *Sepals* broadly ovate, blunt, connate into a flat triangular cup, $\cdot 25$ in. wide, tomentose outside, glabrous within like the outer petals. *Petals* thick, fleshy, ovate, acuminate, $\cdot 4$ to $\cdot 7$ in. long; the inner much smaller. *Stamens* very numerous, the apex of the connective triangular, acute; anther-cells linear, lateral, *Ovaries* about 6, obliquely oblong, densely sericeous, 6- to 8-ovuled; stigma small, sessile. *Ripe carpels* globose to ovoid, slightly apiculate and slightly tapering to the base, densely velvety and minutely tomentose, 1 to $2\cdot 25$ in. long and 1 to $1\cdot 2$ in. in diam.: stalks stout, velvety, $\cdot 75$ to $1\cdot 75$ in. long; Hook. fil. Fl. Br. Ind. I, 79; Miq. Fl. Ind. Bat. I, pt. 2, 35; Wall. Cat. 9411. *M. mollissimum*, Miquel Fl. Ind. Bat. Suppl. 374. *Uvaria latifolia*, Blume Fl. Jav. Anon. t. 15. *Unona latifolia*, Dunal Anon. 115. *Uvaria longifolia*, Bl. Bijdr. 13.

Malacca; Griffith. Singapore: Maingay, Hullett. Perak: very common. Distrib.:—Sumatra, Java, Philippins.

Uvaria latifolia, Blume, as described and figured by that author has larger flowers than the common Perak plant and its carpels are globular, whereas those of the Perak plant are ovoid and apiculate. The plant figured by Blume does, however, occur there, but it is not common. The forms may be characterised thus:—

Var. *typica*: flowers .7 in. long: fruit globular, not apiculate, 1 in. in diam. *Uvaria latifolia*, Blume l. c. t. 15. Perak, Java.

Var. *ovoidea*: flowers .5 in. long: fruit ovoid, slightly apiculate, often oblique, as much as 2.25 in. long, very oblique and warty when young. *M. latifolium*, H. f. and Th. Fl. Br. Ind. 79. Malacca, Perak, Singapore. The common form in the Malay Peninsula.

5. MELODORUM CYLINDRICUM, Maingay in Hook. fil. Fl. Br. Ind. I, 80. A climber: young branches minutely rusty-pubescent, speedily glabrous and dark-coloured. *Leaves* coriaceous, elliptic-oblong, brownish when dry, acute or acuminate, the base rounded or slightly narrowed; upper surface quite glabrous, the lower paler, minutely pubescent; main nerves 8 to 10 pairs, spreading, very faint; length 2.5 to 4.25 in., breadth 1.6 to 1.8 in., petiole .5 in. *Flowers* .5 in. long, solitary, axillary, drooping; buds short, pyramidal, adpressed, brown-pubescent: pedicel short, stout, with minute bracteole. *Sepals* small, triangular, connate, forming a flat spreading cup. *Outer petals* triangular-ovate, triquetrous with an excavated base; the inner very small, triangular, glabrous. *Stamens* numerous, the apex of the connective orbicular. *Ovaries* 4 to 6, sericeous. *Ripe carpels* cylindrical, curved, both ends obtuse, sub-tubercular, minutely brown-pubescent, 1 to 1.75 in. long and .35 to .75 in. in diam.; pericarp thin; stalk .5 in. long, stout. *Seeds* many, horizontal, in two series, compressed, .65 in. long, shining, with a small cartilaginous arillus.

Malacca; Maingay (Kew Distrib.) No. 78. Singapore: Ridley, No. 2115.

6. MELODORUM HYPOGLAUCUM, Miquel in Ann. Mus. Lugd. Bat. II, 37. A strong creeper: young branches minutely rufous-pubescent, ultimately glabrous, rather pale and much tubercled. *Leaves* thinly coriaceous, oblong-lanceolate to oblong-elliptic, acute or shortly acuminate, the base rounded or cuneate; upper surface glabrous except the rufous-puberulous midrib; lower minutely hoary-puberulous, the 10 or 12 pairs of bold oblique curving main nerves ultimately glabrous and darker-coloured; length 3 to 5.5 in., breadth 1.35 to 2.2 in., petiole .25 in. *Flowers* .5 to .8 in. long, in lax, 2- to 3-flowered, axillary racemes or (by abortion of the leaves) in lax, terminal, 10- to 12-flowered panicles; pedicels as long as the flowers, slender; bracteoles 1 or 2, minute. *Sepals* ovate, acute, concave, conjoined only at the base, rufous-pubescent outside; puberulous within. *Petals* leathery, linear-lanceolate,

the base expanded and concave: the outer minutely rufous-tomentose on the external surface, paler and pubescent on the internal, .5 to .8 in. long, concave for their whole length: the inner one-third shorter with a glabrous concavity at the base only, the rest triquetrous, and puberulous. *Stamens* numerous; apical process of connective large, broader than the anther-cells, sub-globular. *Ovaries* about 12, oblong, golden-silky: with 4 to 6-ovules in 2 rows: stigma large sub-capitate; style short. *Ripe carpels* globose or ovoid-globose, tubercled, puberulous or glabrescent, 1 in. long; stalks about the same length, striate. *Seeds* about 4 or 5, oval, compressed, smooth, brown, shining.

Perak: Scortechini, King's Collector.

This plant agrees fairly well with the only specimens of *Melodorum hypoglaucum*, Miq. which I have been able to consult. It also agrees fairly with Miquel's description of that species. But its petals and stamens, and its ovaries externally are rather those of *Xylopiä* than of *Melodorum*; although its habit, its torus and carpels are emphatically those of the latter genus. In the number of ovules it agrees with the majority of the species of *Melodorum*. It thus forms a connecting link between the two genera.

7. *MELODORUM PARVIFLORUM*, Scheffer in Nat. Tijdsch. Ned. Ind. XXXI, 344. A powerful climber; young shoots minutely rusty-tomentose, the bark dark-coloured. *Leaves* coriaceous, more or less broadly elliptic, abruptly acute; the base broad, rounded: upper surface pale yellowish-green when dry, when young minutely stellate-pubescent, when old glabrescent or quite glabrous, the midrib always tomentose; under surface softly rufous-pubescent, the nervation and venation very prominent; main nerves 13 to 15 pairs, oblique, curving, inter-arching close to the edge; length 3 to 6 in., breadth 2.25 to 3.2 in., petiole .4 in. *Flowers* .5 in. long, in lax axillary or terminal rusty racemes often more than half as long as the leaves: pedicels .4 to .6 in. long with 1 or 2 small bracteoles. *Sepals* triangular, spreading, connate at the base, rusty-tomentose outside, glabrescent inside like the petals, .1 in. long. *Petals* thick, leathery, oblong-lanceolate with broad bases; the outer .5 in. long; the inner smaller, concave at the base, triquetrous in the upper half. *Stamens* numerous, the connective with compressed sub-quadrate apical appendage. *Ovaries* narrow, elongate, densely sericeous, 6- to 8-ovuled. *Ripe carpels* globular, sometimes very slightly apiculate, densely but minutely dark-brown tomentose, .8 in. diam.; stalks rather longer, slender, tomentose.

Perak: King's Collector.—Distrib.: Bangka.

A species closely allied to *M. sphaerocarpum*, Blume. The leaves of this are, however, larger, the upper surface is stellate-tomentose

when young and dries a pale yellowish-green; the flower-racemes are much longer and laxer, and the flowers larger.

8. *MELODORUM SPHAEROCARPUM*, Miq. Fl. Ind. Bat. I, pt. 2, p. 35. A strong climber: young branches and all others parts more or less dark rusty-velvety tomentose. *Leaves* elliptic-oblong, obtuse and very slightly apiculate, slightly narrowed to the rounded base; upper surface with harsh, short pubescence, the midrib tomentose; lower surface uniformly and minutely soft-pubescent: main nerves 8 to 12 pairs, oblique not inter-arching at the tips, prominent beneath; the connecting veins transverse oblique, rather prominent, length 2·5 to 4·5 in., breadth 1·25 to 2 in., petiole ·35 in. *Flowers* ·6 or ·7 in. in diam., in axillary or terminal racemes or panicles; pedicels ·35 to ·5 in. long with a small supra-basal bracteole. *Sepals* ovate-acuminate, connate at the base, spreading, minutely tomentose outside, glabrescent inside. *Petals* thick, leathery, brown outside, pink within, ovate, acuminate, slightly pouched at the base; the outer ·3 to ·35 in. long, tomentose outside, puberulous within: the inner smaller than the outer, more concave at the base, glabrous or glabrescent, the upper part very thick. *Stamens* numerous, the apex of the connective thick, obliquely triangular; anther-cells linear, lateral. *Ovaries* about 6, elongate, oblique, pubescent, with 6 to 8 ovules: style short, glabrous: stigma small. *Ripe carpels* globular, harshly and minutely pubescent, 1·1 in. in diam.: stalks rather slender, about twice as long. *Unona sphaerocarpa*, Blume Bijdr. 12: Fl. Javae Anon. 79 t. 16.

Perak: King's Collector.

This is allied to *M. latifolium*; but has smaller leaves with fewer nerves; its pubescence is very dark rusty, not tawny; and the apices of the anthers are truncate, not bearing a broad triangular, acute point. It is also allied to *M. parviflorum*, Schaff.

9. *MELODORUM LANUGINOSUM*, Hook. fil. and Thoms. Fl. Ind. 117. A strong creeper; young branches softly rufous-tomentose. *Leaves* coriaceous, oblong, sometimes sub-obovate-oblong, abruptly acute or shortly acuminate, rarely obtuse, the base rounded; upper surface glabrous, the midrib rufous-tomentose, olivaceous when dry; lower surface densely rufous-lanate; main nerves 12 to 20 pairs, oblique, curving, inter-arching close to the edge, prominent beneath; length 3·5 to 9 in., breadth 1·9 to 3·5 in.; petiole ·4 to ·6 in., stout, tomentose. *Flowers* 1·25 to 1·5 in. long, axillary or leaf-opposed, solitary, or in short 2- to 4-flowered cymes; pedicels stout, lanate, ·5 in. long, with a single basal bracteole. *Sepals* ovate, spreading, slightly connate, golden or rufous-lanate outside, glabrous inside like the outer petals. *Petals* thick, leathery, oblong-lanceolate from a broad base, sub-acute, the outer 1·25

to 1·5 in. long; the inner smaller, glabrescent or glabrous, concave at the base. *Stamens* numerous the connective obliquely triangular at the apex; the anther-cells very narrow, lateral. *Ovaries* obovoid, oblique, curved, densely sericeous, 4- to 6-ovuled; style glabrous. *Ripe carpels* sessile, shortly stalked, sub-globose, narrowed to the base; densely and softly rufous-tomentose, about ·75 in. in diam. when ripe; seeds about 4. Miq. Fl. Ind. Bat. I, Pt. 2, 35; Hook. fil. Fl. Br. Ind. I, 79. *Uvaria tomentosa*, Wall. Cat. 6454.

Penang: Wallich, Curtis. Singapore; Wallich. Pangkore: Curtis. Penang; Scortechini, Wray, King's Collector.

At once distinguished by its large flowers, lanate leaves and sessile, or shortly stalked, rufous-tomentose fruit.

10. MELODORUM MAINGAYI, Hook. fil. and Thoms. Fl. Br. Ind. I, 80. A climber: young branches pubescent, dark-coloured. *Leaves* coriaceous, reddish-brown when dry, broadly elliptic or oblong, rounded at both ends, the tip sometimes minutely apiculate; upper surface glabrous except the puberulous midrib; lower glaucous and finely pubescent; main nerves 14 to 16 pairs, spreading, slightly prominent and dark-coloured beneath; length 3 to 6 in., breadth 1·5 to 2·35 in.; petiole ·6 in. *Flowers* 1·25 to 1·5 in. long, solitary, axillary; buds swollen at the base, narrowed and triquetrous above: pedicels ·25 to ·5 in., stout; bracteoles several, small. *Sepals* orbicular, sub-acute, quite connate into a disk, ·35 in. in diam. *Petals* leathery; the outer oblong-lanceolate, with broad base, flat but keeled down the middle inside, outside minutely rufous-tomentose, inside hoary-pubescent; inner very small, triangular-ovate, glabrous. *Stamens* numerous, small, with a broad rounded apical process, convex. *Ovaries* about 6, sericeous on one side; stigma subsessile. *Ripe carpels* oblong, tapering to each end, the apex shortly beaked, rusty-puberulous; the pericarp thick, 1·5 to 2 in. long and ·75 in. in diam.; stalks ·5 in. long, stout. *Seeds* many, in horizontal rows, ·5 in. long testa shining, not margined.

Penang; Maingay (Kew Distrib.,) No. 108, Curtis, No. 1046. Perak: Wray, 1112.

11. MELODORUM PRISMATICUM, Hook. fil. and Thoms. Fl. Br. Ind. 121. A large creeper; young branches glabrous, dark-coloured. *Leaves* coriaceous, oblong, elliptic-oblong, rarely obovate-oblong, abruptly and shortly acuminate; the base broad, rounded: upper surface glabrous except the minutely puberulous midrib; lower surface glaucous, reticulate, finely pubescent especially on the midrib; main nerves 12 to 18 pairs, spreading, faint especially near the tip, the secondary nerves prominent; length 4·5 to 8·5 in., breadth 2·3 to 3·3 in., petiole ·5 to ·7 in. *Flowers* 1·5 to 2 in. long, axillary, solitary; pedicels ·3 to ·6 in. long,

rufous-tomentose, with 1 large bracteole above the middle and several smaller near the base. *Sepals* quite connate into a flat, obtusely 3-angled disk, .3 in. broad, pubescent outside, glabrous and tubercled inside. *Petals* very thick: the outer linear-lanceolate, 1.5 to .2 in. long, triquetrous, rufous-tomentose outside, puberulous inside: the inner thinner and only about .3 in. long, triangular, ridged outside, much excavated and glabrous at the base inside, otherwise puberulous. *Stamens* numerous, with very short filaments, anthers linear, apex of connective obliquely triangular. *Ovaries* elongate, oblong, tapering to the apex, shortly pubescent: ovules about 14, in 2 rows; style short, lateral; stigma sub-capitate, lobulate. *Ripe carpels* ovoid, blunt, tuberculate, puberulous, becoming sub-glabrous, 1.4 in. long and .8 in. in diam.: stalks .8 to 1 in., stout. *Seeds* in 2 rows, horizontal compressed, oval, black, shining. Hook. fil. Fl. Br. Ind. I, 81; Miq. Fl. Ind. Bat. I, Pt. 2, 36. *Pyramidanthe rufa*, Miq. Ann. Mus. Lugd. Bat. II, 39. *Uvaria rufa*, Wall. Cat. 6455. *Oxymitra bassiaefolia*, Teysm, and Binnin. in Tijdsch. Ned. Ind. XXV, (1863), 419.

Penang, Malacca, Perak, Singapore: common. Distrib.: Borneo.

Authentic specimens both of *Pyramidanthe rufa* and of *Oxymitra bassiaefolia*, T. and B. shew that they unmistakably belong to this species. Specimens of the former from Bangka and from the Buitenzorg Botanic Garden have, however, their leaves rather more hairy beneath than is usual in Perak specimens and their flowers are also rather longer.

12. MELODORUM MACRANTHUM, Kurz in Journ. As. Soc. Bengal, 1872, Pt. II, 291; 1874, Pt. II, 56; F. Flora Burma, I, 42. A small tree: all parts except the young leaf-buds and the flower glabrous; young branches dark-coloured, rather slender. *Leaves* membranous, elliptic-oblong, sometimes slightly obovate, shortly and abruptly acuminate, the base cuneate; upper surface shining, the lower dull; main nerves 12 to 16 pairs, faint and much more prominent than the secondary, forming a double set of intra-marginal arches: length 6 to 8 in., breadth 2.5 to 3.5 in., petiole .3 to .4 in. *Flowers* solitary, axillary or from the branches below the leaves, 3 to 5 in. long, drooping; pedicels .5 to .75 in. long, obscurely bracteolate at the base only. *Sepals* broadly ovate, sub-acute, coriaceous, pubescent at the edges inside, glabrous outside, connate for half their length, .45 in. long. *Petals* greenish-white, becoming yellowish, coriaceous; narrowly linear-lanceolate, acuminate, the outer row flat, adpressed-puberulous with a glabrous patch at the base inside, 3 to 5 in. long; the inner row only 1 to 1.25 in. long, cohering by their edges, vaulted at the base and with a glabrous patch; the limb keeled inside, puberulous on both surfaces. *Stamens* numerous, the anther-cells linear, elongate; apical process of connective narrowly tri-

angular, pointed. *Ovaries* numerous, narrowly oblong, adpressed-rufous-pubescent, 4-ovuled: style nearly as long as the ovary, cylindric, bent outwards, glabrous; stigma small, slightly bifid. *Ripe carpels* oblong, blunt, tapering at the base, slightly rugose, glabrous, 1·25 to 1·5 in. long and about ·5 or ·6 in. in diam.: stalk ·4 to ·5 in. *Seeds* 1 or 2, compressed, ovoid, smooth. *Unona macrantha*, Kurz. in Andam. Report, Ed. I, App. B. I: *Pyramidanthe macrantha*, Kurz. l. c. Ed. 2, p. 29.

S. Andaman; Kurz, King's Collector.

In some of its characters, (*e. g.*, the erect habit, the fewness of the ovules, and the thin texture and flatness of the much elongated outer petals) this does not quite conform to the characters of typical *Melodorum*. By its thin elongated outer petals, it approaches the *Dasyaschalon* section of *Unona*; but the fewness of its ovules excludes it therefrom. From *Xylophia*, which it in some respects resembles, it is chiefly excluded by the very convex torus of its flowers, and by the very pointed apical appendage of its stamens. The stamens on the other hand are those of *Melodorum*, and the petals resemble those of *M. prismaticum* (*Pyramidanthe rufa*, Miq.). On the whole therefore, I think, it best to leave this plant in the genus to which Kurz finally referred it.

13. *MELODORUM ELEGANS*, Hook. fil. and Thoms. Fl. Ind. 122. A large climber: young branches slender, puberulous at first, ultimately glabrous, dark-coloured. *Leaves* thinly coriaceous, oblong-lanceolate, acuminate, slightly narrowed to the rounded base: upper surface olivaceous when dry, glabrous: lower paler, puberulous, minutely reticulate, the 12 or 13 pairs of main nerves spreading, faint: length 2·5 to 3·5 in., breadth 1 to 1·25 in., petiole ·25 to ·35 in. *Flowers* axillary, solitary or 2 or 3 in a fascicle, ·35 to ·65 in. long: pedicels slender, ·35 to ·6 in. long often deflexed, with 2 or 3 minute basal bracteoles. *Sepals* ovate, acute, united at the base only, spreading, outside tubercular and pubescent, inside glabrous and concave, ·1 in. long. *Petals* leathery, the outer broadly ovate, sometimes minutely ovate-oblong, silky, rufous-tomentose outside, hoary-puberulous within, with a perfectly glabrous patch at the concave base, ·35 to ·6 in. long: inner petals only ·25 in. long, very thick, triquetrous and puberulous above, concave and glabrous at the base, inside. *Stamens* numerous, with filaments half as long as the anther-cells; apical process of connective short, thick, obliquely triangular. *Ovaries* narrowly oblong, glabrous, with 8 ovules in 2 rows: style short, lateral. *Ripe carpels* ovoid or ovoid-globose, blunt at each end, glabrous, ·35 to ·5 in. long: stalks slender, ·25 in. long, compressed, black, shining, pitted. Hook. fil. Fl. Br. Ind. I, 82: Miq. Fl. Ind. Bat. I, pt. 2, p. 36. *Uvaria elegans*, Wall. Cat. 6474A.

This is closely allied to *M. fulgens*, H. f. and T.; but its flowers have

more slender and usually longer pedicels: the ovary of this is moreover glabrous, while that of *M. fulgens* is pubescent and the carpels of this are under half an inch in length, while those of *M. fulgens* are three times as long. This is also allied to *M. Kentii*, H. f. and Th., the ovaries of which have, however, never more than two ovules.

Penang: Wallich. Malacca: Maingay (Kew Distrib.,) No. 75. Perak: King's Collector, Wray, Scortechini.

14. MELODORUM PISOCARPUM, Hook. fil. and Thoms. Fl. Ind. 123. A powerful climber: young branches glabrous, black. *Leaves* coriaceous, elliptic or elliptic-oblong, sometimes obovate-elliptic, shortly and abruptly acuminate; the base rounded or sub-cuneate: upper surface olivaceous when dry, glabrous, shining; the lower glaucous, slightly puberulous when young: main nerves 10 to 12 pairs, spreading, very indistinct; length 2·5 to 4 in., breadth 1·25 to 1·8 in., petiole ·35 in. *Flowers* ·3 to ·65 in. long, axillary, solitary or in pairs; pedicels rather stout, deflexed, rufous-puberulous, bi-bracteolate at the base, ·25 to ·35 in. long. *Sepals* broadly ovate, acute, concave, connate into a triangular cup, rufous-puberulous outside, glabrous inside, persistent. *Petals* thick: the outer flat, oblong-ovate, acute, minutely silky, rufous-tomentose outside, hoary pubescent inside except on the glabrous basal excavation, ·3 to ·65 in. long: *inner petals* less than half as long, with a large glabrous basal concavity and a short, thick, triquetrous point, hoary-puberulous. *Stamens* numerous, filament very short, apical process of connective orbicular. *Ovaries* narrowly oblong, glabrous, pitted, 2-ovuled: style lateral, nearly as long as the ovary. *Ripe carpels* globular, slightly tubercled, glabrous, ·25 in. in diam.: stalks about as long. *Seeds* 2, plano-convex, dark-brown, shining, pitted. Hook. fil. Fl. Br. Ind. I, 82; Miq. Fl. Ind. Bat. I, Pt. 2, 37. *M. pyramidule*, Maingay MSS. *Uvaria mabiformis*, Griff. Notulae, IV, 709.

Malacca; Griffith, Maingay (Kew Distrib.) No. 77. Singapore; Ridley. Penang; Curtis. Perak; common. Distrib. Sumatra, Forbes, No. 2182.

Only two species of *Melodorum* besides this have glabrous ovaries (*M. Kentii* and *M. elegans*); but whereas those of this and *M. Kentii* are 2-ovuled, the ovaries of *M. elegans* have 8, or, according to Sir Joseph Hooker, sometimes 10 ovules. This species has however different leaves from the two above mentioned, and its carpels are much smaller and quite globular. As in other species of *Melodorum*, there is considerable variability in the size of the flowers in this species.

20. XYLOPIA, Linn.

Trees or shrubs. *Leaves* coriaceous. *Flowers* axillary, solitary

cymose or fascicled; buds triquetrous, conic, often slender. *Sepals* 3, valvate, connate. *Petals* 6, elongate, valvate, in 2 series; outer flat or concave; inner nearly as long, trigonous, concave at the base only. *Torus* flat, or hollow and enclosing the carpels. *Stamens* oblong, truncate or connective produced; anther-cells remote or contiguous, often septate and with a large pollen-grain in each cellule. *Ovaries* 1 or more; style long, clavate; ovules 2-6 or more, 1- to 2-seriate. *Ripe carpels* long or short, continuous or moniliform, usually several-seeded.—Distrib. Tropics generally; species 60 to 70.—Closely allied to *Melodorum*, but very different in habit.

Leaves quite glabrous.

Leaves 6 or 7 in. long ... 1. *X. oxyantha*.

Leaves between 3 and 5 in. long.

Ripe carpels cylindric, boldly tubercled 2. *X. dicarpa*.
 " " " smooth ... 3. *X. malayana*.

Leaves between 2 and 3 in. long.

Flowers always solitary; pedicels with 2 or 3 orbicular bracteoles, apical process of stamens rounded, anther-cells septate ... 4. *X. Maingayi*.

Flowers solitary or in pairs, .5 in. long: pedicels with orbicular basal bracteoles; apical process of stamens rounded; anther-cells septate... 5. *X. pustulata*.

Flowers in fascicles or solitary, .75 in. long: pedicels ebracteolate; apical process of stamens oblong: anther-cells not septate ... 6. *X. fusca*.

Both surfaces of leaves glabrous, the midrib alone pubescent in its lower half on the upper surface; length 5.5 to 9.5 in. ... 7. *X. Curtisii*.

Leaves glabrous on the upper surface (the midrib pubescent in *X. caudata*), the lower slightly pubescent or puberulous.

Leaves more or less lanceolate, acute or acuminate, not at all obovate.

Leaves 2 or 3 in. long.

Leaves not glaucous beneath.

Flowers .5 to .57 in. long, solitary, axillary, obtuse ... 8. *X. elliptica*.

Flowers .2 to .25 in. long, axillary, solitary, or 2 to 3 together ... 9. *X. caudata*.

- Leaves glaucous beneath ... 10. *X. stenopetala.*
 Leaves 3·5 to 5·5 in. long, leaves glaucous beneath; petals very long and narrow ... 10. *X. stenopetala.*
 Leaves more or less obovate or oblanceolate, 4 to 7 in. long.
 Leaves 1·75 to 4 in. broad; flower pedicels ·2 to ·25 in. long; ripe carpels broadly ovoid, blunt, sub-glabrous ... 11. *X. Scortechinii.*
 Leaves 1·75 to 2·5 in. broad; flower pedicels ·5 to ·8 in. long; ripe carpels globular, densely and minutely yellowish-tomentose ... 12. *X. olivacea.*
 Upper surfaces of leaves glabrous (the midrib alone pubescent in some): under surfaces uniformly pubescent.
 Under-surface of leaves adpressed-rufous-sericeous; length 2 to 3 in. ... 13. *X. obtusifolia.*
 Under-surface of leaves deep brown, the pubescence slightly paler; length 3 to 4·5 in.; ripe carpels obovoid-oblong, blunt ... 14. *X. magna.*
 Under-surface of leaves purplish-brown, pubescent; length 3·5 to 5·5 in.; main nerves 10 to 12 pairs; ripe carpels much elongate, cylindric, many-seeded ... 15. *X. ferruginea.*
 Under-surface of leaves brownish-tomentose; length 6·5 to 8·5 in.; nerves 12 to 14 pairs ... 16. *X. Ridleyi.*

1. XYLOPIA OXYANTHA, Hook. fil. and Thoms. Fl. Br. Ind. I, 85.

A tree: young parts puberulous; the branchlets rather stout, striate. *Leaves* coriaceous, ovate or oblong, abruptly and shortly acuminate, glabrous, glaucous on the lower surface; main nerves 12 to 15 pairs, spreading, thin; length 6 to 7 in., breadth 2·5 to 3 in., petiole ·35 in. *Peduncles* axillary, in fascicles, ·35 to ·5 in. long, adpressed-pubescent. *Sepals* broadly ovate. *Outer petals* narrowly linear, tapering at the apex, yellowish pubescent, slightly keeled at the back, 1·25 to 1·5 in. *Stamens* and *ovaries* as in *X. ferruginea*. *Habzelia oxyantha*, Hook. fil. and Th. Fl. Ind. 124; Miq. Fl. Ind. Bat. I, pt. 2, 37. *Uvaria oxyantha*, Wall. Cat. 6478.

Singapore: Wallich.

2. XYLOPIA DICARPA, Hook. fil. and Thoms. Fl. Br. Ind. I, 85.

A tree 20 to 25 feet high; branches glabrous, dark-coloured, minutely

dotted. *Leaves* coriaceous, elliptic-lanceolate, acute or acuminate, the base acute; both surfaces glabrous, minutely reticulate; main nerves about 10 pairs, spreading, very faint, the secondary nerves almost as distinct; length 3 to 4·5 in., breadth 1·5 to 1·75 in., petiole ·25 in. *Flowers* solitary or in pairs, pendent, 1·5 in. long: pedicel very short with 1 to 3 orbicular, amplexicaul, glabrous bracteoles. *Sepals* ovate, obtuse, tubercled, connate to the middle. *Petals* linear oblong, slightly expanded and concave at the base, hoary, pubescent; the inner narrower and shorter than the outer, sub-trigonous. *Stamens* numerous, the inner rudimentary: apical process rounded; anthers linear, septate. *Ovaries* 2 to 4, pilose, multi-ovular: style short. *Ripe carpels* cylindrical, blunt at each end, much tubercled, puberulous, 1·5 in. long and about ·75 in. in diam. *Seeds* 7 or 8, compressed, the testa pale, scaly.

Singapore: Maingay (Kew Distribution *in part*) No. 84, King's Collector No. 7079.

3. *XYLOPIA MALAYANA*, Hook. fil. and Thoms. Fl. Ind. 125. A slender tree: young branches thin, glabrous, the buds pubescent. *Leaves* thinly coriaceous, shortly and bluntly acuminate, the base cuneate; both surfaces glabrous; main nerves about 8 pairs, faint, spreading; length 3·5 to 5 in., breadth 1·5 to 2 in., petiole ·2 in. *Flowers* ·6 to ·9 in. long, solitary or in pairs, axillary; pedicels rufous-pubescent, ·1 in. long, with several bracteoles at the base. *Sepals* broadly ovate, sub-acute, puberulous outside and on the edges, glabrous inside, ·15 in. long and as broad. *Petals* linear-oblong, tapering to the apex, concave and glabrous at the slightly expanded base, densely pubescent elsewhere; the inner slightly narrower and shorter than the outer and more concave at the base. *Stamens* numerous, the apices rhomboid, papillose; the anthers long, lateral, with transverse divisions. *Pistils* about 6; the ovaries oblong, densely pale-hirsute, about as long as the stamens, 2-ovuled; styles about as long as the ovaries and projecting far above the stamens, glabrous, sub-cylindrical, clavate. *Ripe carpels* (fide Maingay) ·35 to 1 in., several-seeded; stalk short, thick. Hook. fil. and Thoms. Fl. Br. Ind. I, 85; Miq. Fl. Ind. Bat. I, Pt. 2, 38. *Parartabotrys sumatrana*, Miq. Fl. Ind. Bat. Suppl. 374; Scheffer in Nat. Tijdsch. Ned. Ind. XXXI, 15.

Malacca; Griffith, Derry, Maingay (Kew Distrib.) No. 81. Singapore, Ridley. Perak; Scortechini. Distrib., Sumatra.

4. *XYLOPIA MAINGAYI*, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree? Young branches rusty-pubescent, afterwards glabrous and with white dots. *Leaves* small, coriaceous, elliptic or elliptic-oblong, subacute or obtusely acuminate, the base sub-cuneate: both surfaces glabrous and reticulate, the upper pale, the lower dark; main nerves slender; length 2

to 3 in., breadth 1 to 1.25 in.; petiole .25 to .3 in. *Flowers* solitary, pendent, pale-orange; pedicels very short, stout, curved; bracteoles 2 or 3, orbicular, rusty-tomentose. *Sepals* broadly ovate, connate to the middle, rusty-tomentose. *Petals* flat, linear-oblong, sub-acute, softly tomentose except the glabrous concave base; the inner narrower, almost as long, trigonous. *Stamens* with rounded apiculus: the anthers narrow, septate. *Ovaries* about 9, with 6 ovules; style glabrate. *Ripe carpels* unknown.

Malacca: Maingay.

5. *XYLOPIA PUSTULATA*, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree: young branches pale, glabrous, minutely white-dotted. *Leaves* coriaceous, small, elliptic, sub-obtuse, the base acute, both surfaces glabrous, the lower reddish brown and reticulate: main nerves faint, not more prominent than the secondary. *Flowers* solitary or in pairs, axillary, .5 in. long, pendent; pedicels very short, with orbicular, ciliate, deciduous basal bracteoles. *Sepals* short, ovate, sub-acute, rusty-pubescent, united to the middle. *Petals* linear, sub-acute, densely adpressed-pubescent; the outer obtuse with a rather broad concave base, the inner shorter and much narrower with a broader concave base. *Stamens* linear with rounded apiculus: the anthers long, septate. *Ovaries* 5 to 8, hirsute; the style slender with clavate stigma; ovules several. *Ripe carpels* unknown.

Malacca: Maingay (Kew Distribution) No. 86.

6. *XYLOPIA FUSCA*, Maingay ex Hook. fil. Fl. Br. Ind. I, 85. A tree; young branches rather stout, glabrous, black: buds silky. *Leaves* coriaceous, oblong, obtuse, the base cuneate; upper surface glabrous shining; the lower dull, dark, reticulate; main nerves 8 or 9 pairs, very faint; length 2 to 3 in., breadth .75 to 1 in.; petiole .2 in., stout. *Flowers* .75 in. long, supra-axillary, solitary, racemed, or fasciated; peduncle .25 to .75 in. with several bracts; pedicels .25 in., puberulous, ebracteolate. *Sepals* ovate, acute, connate into a cup with 3 spreading, acute teeth, puberulous outside. *Petals* linear-oblong, tapering to the sub-acute apex: the outer adpressed golden-scriceous outside; the inner narrower and shorter, concave at the base. *Stamens* with an oblong apical process; anthers linear, lateral, not septate. *Ovaries* 4 or 5, cohering into a cone, golden-silky; ovules 10 to 16, in two rows. *Ripe carpels* unknown.

Malacca: Maingay, (Kew Distribution) No. 86.

7. *XYLOPIA CURTISII*, King, n. sp. A tree 30 feet high: young branches stout, glabrous, striate, dark-coloured. *Leaves* very coriaceous, oblong, acute or shortly acuminate; the base cuneate, slightly oblique: upper surface glabrous, shining; the lower dull, darker (when dry),

puberulous on the midrib near the base; main nerves 12 to 20 pairs, very prominent beneath and connected by straight transverse veins; length 5·5 to 9·5 in., breadth 2 to 3 in.; petiole ·35 in., stout. *Flowers* 1 or 2, on stout woody extra-axillary peduncles; pedicels ·2 in. long, rufous-pubescent, with a single large bracteole. *Sepals* thick, spreading, broadly ovate, sub-acute, minutely tomentose on both surfaces but especially on the outer. *Petals* thick, subequal, linear-oblong, obtuse, keeled outside; the claw orbicular, vaulted over the andro-gynœcium and glabrous inside, otherwise minutely tomentose, ·75 in. long. *Stamens* numerous, the heads obliquely truncate and concealing the linear, lateral anthers. *Ovary* solitary, cylindrical, fluted, glabrous, multi-ovulate. *Ripe carpel* ovoid, compressed, silvery-grey, many-seeded, 3 in. long, and 2·5 in. in diam.

Penang: Curtis, No. 1569.

8. *XYLOPIA ELLIPTICA*, Maingay ex Hook. fil. Fl. Br. Ind. I, 86. A tall tree: young branches dark-coloured, glabrous, the youngest pubescent. *Leaves* membranous, small, elliptic, obtusely acuminate, the base rounded or acute: upper surface glabrous, pale; the lower brown, minutely adpressed-pubescent; both reticulate: main nerves 6 or 7 pairs, oblique, very faint; length 1·5 to 2 in., breadth 1 to 1·25 in.; petiole ·2 in., slender. *Flowers* solitary, erect, axillary, ·5 to ·75 in. long: peduncle about half as long, rusty-pubescent like the calyx, bracteoles minute. *Sepals* ovate, sub-acute, united to the middle. *Petals* pale brownish-tomentose; the outer linear-subulate with a broader concave base: the inner trigonous, shorter and narrower than the outer. *Stamens* numerous, minute, the apex rounded; anthers linear. *Ovaries* 1 to 3, densely hairy, 4- to 6-ovuled. *Ripe carpels* unknown.

Malacca: Maingay (Kew Distrib.,) No. 82. Perak: Wray No. 3194. Penang: Curtis, No. 2482:

9. *XYLOPIA CAUDATA*, Hook. fil. and Thoms. Fl. Ind. 125. A shrub or small tree: young branches very slender, minutely pubescent. *Leaves* thinly coriaceous, lanceolate, long and obtusely acuminate, the base cuneate; upper surface glabrous except the pubescent midrib; the lower sparsely adpressed-sericeous: main nerves about 10 pairs, spreading, faint; length 2 to 2·25 in., breadth ·6 to ·8 in.; petiole ·1 in., slender. *Peduncles* 1 to 3, axillary, very short, minutely bracteolate at base and apex. *Flowers* ·2 to ·3 in. long. *Sepals* ovate, sub-acute, connate at the base, adpressed-pubescent outside, glabrous inside. *Petals* linear-oblong, obtuse, pubescent except a small glabrous concave spot at the base, the inner about as long as, but narrower than, the outer. *Anthers* rather numerous, compressed, the apical process narrow. *Ovaries* 2, elongate, sericeous, 2-ovuled: style long, pointed, glabrous, exerted.

Ripe carpels (fide Hooker) 2 or 3, sub-globose or ovoid, pubescent, .5 in. long, 2-seeded. Hook. fil. Fl. Br. Ind. I, 85; Miq. Fl. Ind. Bat. I, Pt. 2, 38. *Guatteria* (?) *caudata*, Wall. Cat. 6452.

Singapore: Wallich, Maingay (Kew Distrib.) No. 79. Malacca; Griffith.

10. *XYLOPIA STENOPETALA*, Oliver in Hook. Ic. Plantar. t. 1563. A tree 50 to 60 feet high: young branches dark-coloured, glabrescent, minutely lenticellate. *Leaves* thinly coriaceous, elliptic-oblong, shortly and obtusely acuminate, the base sub-euneate; upper surface glabrous, shining; the lower glaucous or glaucescent, sparsely adpressed-pubescent; both reticulate; main nerves 10 or 12 pairs, spreading, inter-arching close to the edge, faint: length 2.5 to 4.5 in., breadth 1.1 to 1.6 in., petiole .25 in. *Flowers* axillary, solitary or in fascicles of 2 to 5; pedicels slender, often decurved, puberulous, with one minute bracteole, .5 to .75 in. long. *Sepals* united to form a small puberulous cup with acute, spreading teeth. *Petals* fleshy, very narrow, slightly expanded and concave at the base, minutely tawny-pubescent, the inner slightly shorter and narrower. *Stamens* linear, the connective prolonged into a cylindro-conic apical appendage; the anthers fusiform, lateral. *Ovaries* numerous, elongate, pubescent, 6-ovuled; style filiform: stigma sub-clavate. *Ripe carpels* oblong, sub-terete, narrowed to the stalk, 2 to 2.5 in. long and .5 in. diam.: pericarp fleshy. *Seeds* 1 to 4: stalks thick, .3 in. long.

Penang; on Government Hill at 600 feet: Curtis Nos. 857 and 880.

11. *XYLOPIA SCORTECHINI*, King n. sp. A tree 50 to 60 feet high: young branches rusty-tomentose, ultimately glabrous, much striate and pale brown. *Leaves* coriaceous, obovate-elliptic to elliptic-oblong, very shortly and abruptly acuminate, slightly narrowed to the sub-euneate rounded slightly oblique base: upper surface glabrous, the midrib slightly rufous-puberulous near the base: lower surface pale, sparsely rufous-pubescent especially on the midrib and 10 to 14 pairs of oblique, rather straight, prominently raised main nerves; length 4 to 7 in., breadth 1.75 to 4 in.; petiole .35 in., pubescent. *Flowers* rarely solitary, usually in fascicles of 2 to 5 on tubercles in the axils of leaves or of fallen leaves; pedicels short, (.2 to .25 in.), stout, rusty-tomentose with a sub-mesial bracteole. *Sepals* quite free, broadly ovate, blunt, pubescent outside, glabrous inside. *Petals* thickened, linear-obtuse with an orbicular concave claw, vaulted over the stamens and pistils, 1.25 to 1.75 in. long, pubescent everywhere except on the glabrous concavity of the claw. *Stamens* numerous, with truncate 4- or 5-angled apices concealing the lateral anthers. *Ovaries* few, short, oblong, pubescent, 4- or 5-ovuled; stigma large, oblong. *Ripe carpels* broadly ovoid, blunt, rufous-pubes-

cent when young, glabrescent when old, .8 in. long and .6 in. in diam. *Seeds* about 4, discoid, pale brown, shining. *Drepananthus stenopetala*, Scortechini, MSS.

Perak: Scortechini, No. 1781; King's Collector, No. 8241.

A species allied to *X. olivacea*, King; but with broader leaves, shorter flower pedicels, narrower petals and ovoid sub-glabrous fruit.

12. *XYLOPIA OLIVACEA*, King n sp. A shrub or small tree: young branches pubescent, ultimately brown, striate and glabrous. *Leaves* thinly coriaceous, elliptic-oblong, sometimes slightly obovate, shortly and abruptly acuminate, the base cuneate; both surfaces dull olivaceous when dry; the upper glabrous, the lower paler, slightly scurfy; main nerves 6 to 8 pairs, oblique, curving, inter-arching boldly .15 in. from the margin, prominent beneath; length 3.5 to 7 in., breadth 1.75 to 2.5 in., petiole .25 in., swollen, puberulous, black when dry. *Flowers* solitary or in pairs, supra-axillary; pedicels rather stout, .5 to .8 in. long, cinereous-tomentose with an ovate-lanceolate, mesial bracteole. *Sepals* thick, especially at the base, ovate, acute, connate below the middle, pale cinereous-puberulous on both surfaces. *Petals* sub-equal, fleshy, narrowly linear with a tapering limb and slightly expanded concave vaulted claw, densely and minutely cinereous-tomentose, 1 to 1.5 in. long, the inner shorter. *Stamens* short, cuneate, the broad oblique heads covering the apices of the linear anthers. *Ovaries* few, oblong, densely sericeous, 6- to 8-ovuled; style short, cylindric: stigma large, fleshy. *Ripe carpels* few, globular, with slightly flattened minutely apiculate apex, and an imperfect lateral ridge, densely and minutely yellowish-tomentose, .6 in. in diam., stalks very short. *Seeds* 4 or 5, discoid, smooth, pale brown, shining, separated from each other by imperfect dissepiments.

Perak: up to elevations of 3,000 or 4,000 feet, common. Scortechini, Wray, King's Collector.

13. *XYLOPIA OBTUSIFOLIA*, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree: young branches glabrous, dark-coloured, striate: buds silky. *Leaves* coriaceous, oblong, obtuse or retuse, the base cuneate, upper surface glabrous, shining; the lower adpressed rufous-sericeous: main nerves 8 or 10 pairs, oblique, very faint; length 2 to 3 in., breadth 1 to 1.5 in., petiole .25 in. *Flowers* .5 in. long, axillary, solitary or 2 or 3 in small sub-racemose cymes; pedicels .2 to .25 in., rufous-pubescent with a single bracteole. *Sepals* thick, broadly ovate, acute, united to the middle, pubescent outside, glabrous inside. *Petals* linear-oblong, tapering towards the blunt apex; the outer petals adpressed-rufous-pubescent outside, puberulous within, slightly concave and glabrous at the base; the inner smaller, more concave at the glabrous base, puberu-

lous elsewhere. *Stamens* numerous, elongate, narrow, with an acute apiculus; the anther-cells linear, lateral. *Pistils* one or two, conical, adpressed-pubescent; the style short, thin. *Ripe carpels* oblong, cylindrical, sub-oblique, blunt, 1.25 in. long .7 in. in diam. *Seeds* 3 or 4, globular.

Malacca: Griffith. Perak: King's Collector, No. 2816.

14. *XYLOPIA MAGNA*, Maingay ex Hook. fil. Fl. Br. Ind. I, 84. A tree: young branches tomentose, becoming glabrous and darkly cinereous. *Leaves* coriaceous, ovate-lanceolate to elliptic, sub-acute, the base rounded, the edges slightly revolute when dry; upper surface shining, reticulate, glabrous except the pubescent midrib; under surface deep brown, with rather pale pubescence; main nerves about 10 pairs, spreading, inter-arching some way from the edge, faint: length 3 to 4.5 in., breadth 1.25 to 2 in.; petiole .25 in., pubescent. *Flowers* 2 to 2.5 in. long, solitary or in pairs, axillary: pedicels stout, tomentose, with a single large, ovate, acute, often bifid bract. *Sepals* thick, ovate acute, connate into a 3-toothed cup, adpressed-pubescent outside, glabrous inside. *Petals* sub-equal, the inner narrower and shorter, narrowly linear, slightly expanded and concave at the base, tapering towards the apex, pubescent except in the basal concavity. *Stamens* numerous, elongate, with an oblong obtuse apical process; the anthers lateral, linear, septate. *Pistils* about 15, narrowly oblique, hirsute on the outer side, 4-ovuled. *Style* filiform, long. *Ripe carpels* obovoid-oblong, compressed, blunt, minutely tomentose, 1.4 in. long and .65 in. diam.; stalks thick, only .15 in. long. *Seeds* about 4, in two rows, arillate, the testa bony.

Malacca: Maingay (Kew Distrib.) No. 83. Singapore; Ridley. Perak; Scortechini.

15. *XYLOPIA FERRUGINEA*, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree 20 to 60 feet high; young branches brownish-pubescent. *Leaves* coriaceous, narrowly oblong, acute; the base slightly narrowed and oblique, rounded or minutely sub-cordate; upper surface glabrous, shining; the lower glaucous and softly purplish-brown pubescent: most densely so on the midrib; main nerves 10 to 12 pairs, oblique, inter-arching near the edge, prominent beneath; length 3.5 to 5.5 in., breadth 1.1 to 2 in.; petiole .2 in., channelled. *Flowers* solitary or in pairs, axillary or extra-axillary, erect or pendulous, yellow; pedicels .5 to .75 in., rusty-pubescent; bracteoles 1 to 3, small, lanceolate. *Sepals* broadly ovate-acuminate, connate at the base, spreading, small, pubescent outside, glabrous within. *Petals* linear, fleshy, tapering at the very apex, very long; the outer rufous-pubescent outside, cinereous-puberulous inside, concave at the very base, 1.25 to 2 in. long; inner petals much

narrower and thinner and a little shorter than the outer, cinereous-puberulous. *Stamens* about 24, narrow: anthers linear, lateral, the connective ending in a broadly oblong apical process. *Ovaries* numerous, narrowly oblong, pointed, densely rusty-hirsute, multi-ovular: style short, filiform, glabrous; stigma minute. *Ripe carpels* numerous, much elongate, cylindrical, glabrescent, with transverse partitions between the seeds, many-seeded, sub-moniliform when dry, 2 to 5 in. long. *Seeds* oblong, rugose, minutely pellucid-dotted, .3 in long. *Habzelia ferruginea*, H. f. and T. Fl. Ind. 123. Miq. Fl. Ind. Bat. I, Pt. 2, 37. *Artaboirys malayana*, Griff. Notul. IV, 713.

Malacca: Griffith. Maingay (Kew Distrib.) No. 85. Perak: Scortechini, King's Collector, Wray: common. Selangor: Curtis.

16. *XYLOPIA RIDLEYI*, King n. sp. A tree? Young branches stout, densely rusty-tomentose. *Leaves* coriaceous, obovate-elliptic, abruptly and very shortly acuminate, narrowed from below the middle to the slightly cuneate base: upper surface glabrous except the rufous-puberulous midrib: lower softly rusty-tomentose with longer, superficial, paler hairs: main nerves 12 to 14 pairs, oblique, inter-arching boldly within the margin, prominent on the lower, depressed on the upper, surface; length 6.5 to 8.5 in., breadth 2.75 to 3.5 in.; petiole .5 to .6 in. stout, tomentose. *Flowers* in extra-axillary (often leaf-opposed) fascicles of 3 to 5: pedicels stout, rufous-tomentose, with a single bracteole, .25 to .3 in. long. *Sepals* broadly ovate, long-acuminate, rufous-pubescent outside, glabrous within, .35 in. long. *Petals* filiform, triquetrous, with expanded concave vaulted bases concealing the andro-gynœcium, and glabrous inside, otherwise pubescent, 2.5 to 3.5 in. long. *Stamens* numerous, with truncate 4- or 5-angled heads concealing the elongate, lateral anthers. *Ovaries* obliquely ovoid, densely sericeous, 4- to 6-ovuled: stigmas fleshy, agglutinated. *Ripe carpels* unknown.

Singapore: Ridley.

21. *PHEANTHUS*, H. f. and T.

Trees or climbers. *Flowers* solitary, terminal or in extra-axillary fascicles. *Sepals* 3, small, valvate. *Petals* 6, valvate in 2 rows; outer small like the sepals; inner large, flat, coriaceous. *Stamens* numerous, oblong or quadrate, truncate; anther-cells dorsal, distant. *Carpels* numerous; style cylindrical or clavate, sometimes grooved ventrally. *Ovules* 1-2, sub-basal, ascending. *Ripe carpels* staked, 1-seeded.—DISTRIB. Species about 6; one in Southern Peninsular India, the rest Malayan.

Leaves softly pubescent	...	...	...	1. <i>P. nutans</i> .
Leaves glabrous.				
Ovules and seeds solitary	...	...	...	2. <i>P. lucidus</i> .
Ovules and seeds in pairs	...	...	...	3. <i>P. andamanicus</i> .

1. *PHÆANTHUS NUTANS*, H. f. and Th. Fl. Ind. 147. A small tree : young branches rusty tomentose. *Leaves* membranous, oblong-lanceolate or oblanceolate to obovate-elliptic, caudate-acuminate, the base always narrowed and sometimes acute ; upper surface glabrous, the midrib and main nerves tomentose ; lower softly pubescent, the midrib tomentose : main nerves 10 to 14 pairs, spreading, prominent beneath, inter-arching near the edge : length 5 to 9 in., breadth 1·3 to 4·5 in. ; petiole ·3 in., tomentose. *Flowers* fetid, solitary or 2 or 3 together, drooping, extra-axillary ; pedicels ·5 to 1·5 in. long with 1 or 2 linear bracteoles, pubescent. *Sepals* linear-lanceolate, spreading, tomentose, ·2 in. long. *Petals* very unequal ; the outer small like the sepals ; inner ovate-oblong, acute, yellow, pubescent, 5- to 7-ribbed, ·75 to 1 in. long. *Ripe carpels* ovoid, pubescent, beaked, ·6 in. long and ·35 in. in diam. ; stalk nearly as long. Hook. fil. Fl. Br. Ind. I, 72 ; Miq. Fl. Ind. Bat I, pt. 2, 51. *Uvaria nutans*, Wall. Cat. 6481. *U. tripetala*, Roxb. Fl. Ind. ii, 667. *U. ophthalmica*, Roxb. ex Don Gen. Syst. i, 93.

Singapore ; Wallich and others. Penang ; Curtis. Malacca ; Main-gay, (Kew Distrib.) No. 67. Perak ; at low elevations. Sugei Ujong ; Ridley. Distrib. Moluccas, Sumatra.

2. *PHÆANTHUS LUCIDUS*, Oliver in Hook. Ic. Pl. t. 1561. A tree 40 to 50 feet high : young branches minutely rusty pubescent or almost glabrous, dark-coloured and furrowed. *Leaves* thickly membranous, oblong-elliptic to lanceolate, acuminate, the base cuneate ; both surfaces shining, glabrous except occasionally the puberulous midrib ; main nerves about 8 pairs, oblique, rather prominent beneath : length 4·5 to 6·5 in., breadth 1·25 to 2·25 in. ; petiole ·2 in. *Flowers* solitary, rarely in fascicles of 2 or 3, extra-axillary, erect, ·6 in. to 1 in. in diam., buds triquetrous ; peduncles 1 to 1·25 in. long, slender, puberulous, with 2 minute bracteoles. *Sepals* ovate, acute, less than ·1 in. long. *Outer petals* like the sepals but a little longer : inner petals thick, greenish-yellow, oblong-ovate, acute, about ·5 in. long, glabrescent with puberulous edges. *Anthers* with square truncate heads. *Ovaries* numerous, 1-ovulate. *Ripe carpels* oblong, ·6 in. long and ·3 in. in diam., minutely granular, sub-glabrous as are the ·5 to ·6 in. long stalks.

Penang : Curtis. Perak : at low elevations : King's Collector, Nos. 7275 and 10044.

3. *PHÆANTHUS ANDAMANICUS*, King n. sp. A small glabrous shrub : young branches pale brown, slender. *Leaves* membranous, elliptic or elliptic-lanceolate, acute, slightly narrowed to the rounded base, both surfaces rather pale when dry ; main nerves 15 to 20 pairs, faint, slender, horizontal, forming double loops near the margin, the reticulations faint ; length 4 to 7·5 in., breadth 1·75 to 2·5 in., petiole ·35 in. *Flowers*

·5 to ·75 in. in diam., campanulate, solitary, rarely in pairs, extra-axillary: pedicels ·2 in. long, bracteolate at the base. *Sepals* very small, semi-orbicular. *Outer petals* slightly larger than the sepals and about ·1 in. long; inner petals united at the base, oblong-ovate, sub-acute, ·5 to ·7 in. long, 4 or 5 nerved. *Anthers* numerous, flattened from front to back, about as broad as long with truncate not apiculate heads. *Ovaries* numerous, elongate, narrow, 2-ovuled: stigmas elongate. *Ripe carpels* sub-globular, ·5 in. in diam.: stalks ·5 to ·7 in. *Seeds* two, plano-convex, pale.

South Andaman, King's Collector.

This is a very distinct species recognisable at once by the unusual character of having its petals united at the base and by its 2-seeded carpels.

22. MILIUSA, Leschenault.

Trees or shrubs. *Flowers* usually bi-sexual (dioecious or polygamous in No. 1), green or red, axillary or extra-axillary, solitary, fascicled or cymose. *Sepals* 3, small, valvate. *Petals* 6, valvate in 2 series; outer smaller, like the sepals; inner cohering when young by the margins, at length free. *Torus* elongated, cylindric. *Stamens* definite or indefinite; anthers subdidymous; cells contiguous, ovoid, extrorse; connective more or less apiculate. *Ovaries* indefinite, linear-oblong; style oblong or very short; ovules 1-2, rarely 3-4. *Ripe carpels* globose or oblong, 1- or 2- or many-seeded.—Distrib. Species 8; all Indian.

Flowers dicecious or polygamous ... 1. *M. Roxburghiana*.

Flowers hermaphrodite ... 2. *M. longipes*.

1. MILIUSA ROXBURGHIANA, Hook. fil. and Thoms. Fl. Ind. 150. A small tree; young branches softly pubescent, ultimately glabrous, striate and pale. *Leaves* thinly coriaceous, oblong or oblong-lanceolate, shortly acuminate, the base rounded; upper surface glabrous, the lower sparsely adpressed, pubescent to tomentose; main nerves about 10 pairs, spreading, inter-arching ·15 in. from the base; length 2·5 to 4 in., breadth ·85 to 1·4 in.; petiole ·05 in., pubescent. *Pedicels* 1 to 3 together, axillary, slender, ·5 to 1·5 in. long, sometimes on a short peduncle; bracteoles several, linear. *Flowers* dicecious or polygamous, about ·5 in. long. *Sepals* and outer petals subequal, lanceolate or linear, rusty-tomentose. *Inner petals* ·5 to ·6 in. long, ovate or oblong-lanceolate, sub-acute, nerved, red. *Stamens* in male flower numerous, with obliquely truncate, broad apices. *Ovaries* (in female flower) oblong, glabrous; style oblong ovules 1 or 2. *Ripe carpels* ovoid or oblong, blunt, glabrous, granulate, ·25 to ·35 in. in diam.; stalk ·4 in. long, slender. *Seeds* 1, rarely 2. Hook. fil. Fl. Br. Ind. I, 87; Kurz F. Flora Burma, I, 47. *M. Wallich-*

iana, H. f. and T. l. c. 149. *M. tristis*, Kurz F. Flora Burma, I, 47; *Uvaria dioica*, Roxb. Fl. Ind. ii. 659. *Phacanthus dioicus*, Kurz in Flora LIII. (1870) 274. *Guatteria globosa*, A. DC. Mem. Soc. Genev. V, 43; Wall. Cat. 6448. *Hyalostemma Roxburghiana*, Wall. Cat. 6434; Griff. Ic. Pl. Ind. Or. iv. t. 653.

Sikkim, Himalaya; Assam Hill ranges; Chittagong Hills: Burma; Singapore up to 4,000 feet.

Kurz's species *M. tristis*, (F. Flora Burma, I, 47) appears to be a form of this with larger leaves and flowers than usual. The only specimens of it extant are very poor and better material may shew it to be, as Kurz thought, a distinct species. According to M. Pierre, his Cambodian species *M. mollis* (Fl. Forest. Coch.-Chine. t. 40) is closely allied to *M. Roxburghiana*. The same author's species *M. campanulata* (l. c. t. 41) is also allied to *M. Roxburghiana* and to *M. macrocarpa*.

2, *MILUSA LONGIPES*, King, n. sp. A small tree 15 to 30 feet high: young branches dark-coloured; all parts glabrous except the edges of the sepals and outer petals. *Leaves* membranous, shining, oblong-ob-lanceolate, acuminate, the base sub-cuneate or rounded; main nerves about 12 pairs, spreading, faint: length 5.5 to 7 in., breadth 1.75 to 2.75 in., petiole .1 to .15 in. *Flowers* .5 to .65 in. long, axillary, solitary; pedicels slender, .5 to .75 in. long, (larger in fruit) with 3 or 4 lanceolate bracteoles at the base. *Sepals* and *outer petals* sub-equal, minute, ovate, sub-acute, the edges ciliate. *Inner petals* very much larger than the outer, ovate-oblong, veined, sub-acute, greenish-yellow, .5 or .6 in. long. *Stamens* about 18, compressed, short, often bent, the apiculus broad, shallow. *Ovaries* numerous, elongate, glabrous; *stigma* large, capitate, sessile. *Ripe carpels* numerous, globular-ovoid, blunt, glabrous, sub-granular, .25 to .3 in. long; stalks .75 to 1 in., slender. *Seeds* ovoid.

Perak: at low elevations, Scortechini, King's Collector.

This species approaches *M. macropoda*, Miq: but its leaves are more narrowed to the base and more acuminate.

23. ALPHONSEA, H. f. & T.

Lofty trees. *Leaves* more or less coriaceous, glabrous, shining. *Flowers* small or middle-sized, in leaf-opposed, rarely extra-axillary, peduncled fascicles; buds conical. *Sepals* 3, small, valvate. *Petals* 6, valvate in 2 series, often saccate at the base, larger than the sepals, equal or the inner rather smaller. *Torus* cylindrical or hemispheric. *Stamens* indefinite, loosely packed; anther-cells dorsal, contiguous; connective apiculate. *Ovaries* 1 or more; style oblong or depressed; ovules 4-8, in 2 series on the ventral suture. *Carpels* sub-sessile or stalked.—Distrib. Species 9, all Indian or Malayan.—Baillon Hist. 215 unites this genus with *Bocagea*.

- Leaves rusty-pubescent beneath at all stages ... 1. *A. Maingayi*.
 Leaves glabrous on both surfaces (puberulous on the lower in *A. elliptica*).
 Leaves more than 3 inches long.
 Buds conical; ripe carpels ovoid or globose.
 Leaves glabrous on the upper surface, puberulous on the lower when young, elliptic or ovate-elliptic; main nerves 6 to 8 pairs ... 2. *A. elliptica*.
 Leaves quite glabrous, broadly elliptic, shortly acuminate: main nerves 7 to 8 pairs ... 3. *A. lucida*.
 Buds globose; ripe carpels cylindrical ... 4. *A. sub-indehiscens*.
 Leaves 3 inches long or less: ripe carpels cylindrical ... 5. *A. cylindrica*.
 Of uncertain position (fruit unknown)... 6. *A. Curtisii*.

1. ALPHONSEA MAINGAYI, Hook. fil. and Thoms. Fl. Br. Ind. I, 90.
 A tree: branches rusty-tomentose, ultimately dark-coloured and glabrous. *Leaves* coriaceous, elliptic-oblong or oblong-lanceolate, shortly, and often obtusely, acuminate, the base rounded; upper surface shining, glabrous except the midrib, puberulous near the base; lower surface rusty, conspicuously reticulate, pubescent, the midrib tomentose; main nerves 8 or 9 pairs, oblique, inter-arching far from the edge; length 5 to 7 in., breadth 1.5 to 2.7 in., petiole .25 in. *Flowers* .75 in. in diam., supra-axillary, solitary or in small racemes; pedicels .1 in. long, rusty-tomentose, bracteole small. *Sepals* sub-orbicular, very small. *Petals* ovate, pubescent outside, glabrous within, the outer recurved, the inner smaller. *Stamens* with broad short filaments; the anther-cells small, diverging below. *Ovules* about 20. *Ripe carpels* ovoid, short-stalked, 2 in. long, by 1 in. in diam. *Seeds* many, smooth.

Malacca, Maingay (Kew Distrib.) No. 98.

2. ALPHONSEA ELLIPTICA, Hook. fil. and Thoms. Fl. Br. Ind. I, 90.
 A tree? Young branches rather stout, grey, glabrous. *Leaves* coriaceous, elliptic or ovate-elliptic, shortly and bluntly acuminate or acute, the base abruptly cuneate; upper surface glabrous, shining; the lower reticulate, puberulous when young, glabrous when adult, slightly paler than the upper; main nerves 6 to 8 pairs, spreading, slightly prominent beneath; length 3.5 to 5 in., breadth 1.25 to 1.75 in., petiole .2 in. *Flowers* .8 in. in diam., axillary, solitary or 2 to 3, in short racemes; peduncles very short, multi-bracteate, pedicels .25 to .35 in. long, with 1 or 2 minute bracteoles. *Sepals* sub-orbicular, obtuse, recurved, con-

nate at the base. *Petals* adpressed-pubescent; the outer ovate-lanceolate, reflexed: the inner rather smaller. *Stamens* in several rows, apiculate. *Ovaries* linear-oblong, pubescent; stigma sub-sessile, sub-capitate. *Ovules* numerous, in two series. *Ripe carpels* unknown.

Malacca; Maingay (Kew Distrib.) No. 99.

3. ALPHONSEA LUCIDA, King, n. sp. A shrub 6 to 8 feet high: all parts glabrous except the flower; young branches slender, rather dark-coloured. *Leaves* thinly coriaceous, broadly elliptic, shortly, abruptly and rather obtusely acuminate, the base cuneate; under surface very minutely scaly; main nerves 7 or 8 pairs, oblique, curving, depressed on the upper, bold and prominent on the lower, surface; length 4.5 to 5.5 in., breadth 1.75 to 2.5 in.; petiole .3 in., stout. *Flowers* extra-axillary, solitary or 2 or 3 in racemes: peduncle of raceme short, pedicels shorter than the peduncle, puberulous, ebracteolate, .3 to .4 in. long. *Sepals*, triangular-ovate, connate at the base, reflexed, puberulous outside, glabrous inside. *Petals* yellowish-white, subequal, oblong, oblique, tapering gradually to the sub-acute apex, the base broad, suddenly narrowed and slightly pouched, puberulous, .5 in. long, the inner slightly smaller. *Stamens* in 3 rows; filament very short, connective with a short apiculus. *Ovaries* 4 or 5, oblong, adpressed-pubescent; ovules many, in two rows: stigma sessile, sub-capitate. *Ripe carpels* unknown.

Perak: elevat. 500 feet. King's Collector, No. 5387.

4. ALPHONSEA SUB-DEHISCENS, King, n. sp. A shrub or small tree: young branches rather slender, puberulous at first but speedily becoming glabrous. *Leaves* thinly coriaceous, oblong-lanceolate to elliptic, shortly and rather bluntly acuminate, the base rounded or sub-cuneate; upper surface glabrous except the puberulous midrib, the lower reticulate, sparsely puberulous or glabrous; main nerves about 10 pairs, spreading, very faint; length 4 to 6 in., breadth 1.75 to 2.3 in.; petiole .25 in. *Flowers* globular, scarcely opening, .25 in. in diam., solitary or in pairs, slightly supra-axillary, on short pedicels, with several large sub-orbicular pubescent bracteoles. *Sepals* thick, fleshy, connate into a flat cup, .3 in. in diam., with three broad obtuse, spreading lobes. *Petals* larger than the sepals, thick, hard and fleshy, valvate, orbicular, acute, concave, outside tawny-pubescent, inside glabrous except near the apex; the outer .2 in. in diam., the inner row rather smaller than the outer. *Stamens* numerous; the apical process large, fleshy, conical, concealing the apices of the narrow, linear anther cells: torus conical. *Pistil* solitary, clavate, minutely puberulous, many-ovuled: stigma minute. *Ripe carpels* elongate-clavate, puberulous, 1 to 1.25 in. long, tapering into a stalk, .25 to .3 in. long. *Seeds* about 10.

Perak: King's Collector.

The dried fruits of this species sometimes open longitudinally by a sort of quasi-suture—hence the specific name.

5. *ALPHONSEA CYLINDRICA*, King, n. sp. A small tree 20 to 30 feet high; young branches with long, soft, pale brown pubescence, ultimately glabrous, cinereous, striate. *Leaves* thinly coriaceous, ovate-lanceolate, sometimes oblanceolate, shortly and bluntly acuminate; the base rounded or sub-cuneate, slightly oblique; upper surface glabrous, shining; the midrib pubescent, the lower dull sparsely pubescent on the midrib and nerves; main nerves 7 to 9 pairs, spreading, faint; length 2·5 to 3·5 in., breadth 1·1 in. to 1·5 in., petiole ·15 in. *Flowers* ·35 in. long, single or 2 or 3 from leaf-opposed or extra-axillary peduncles; peduncles ·15 to ·4 in. long, with deciduous, distichous, sub-orbicular bracts: pedicels 2 to ·35 in. long, pubescent, with 1 bracteole near the base. *Sepals* semi-orbicular, blunt, connate at the base, tomentose outside, glabrous within, reflexed. *Petals* subequal, oblong-ovoid, tapering from the sub-saccate base to the sub-acute apex, tomentose outside, pubescent minutely inside except a glabrous patch at the base, 4 in. long. *Stamens* in 3 rows with short, broad filaments: anthers ovate, the connective very slightly apiculate. *Ovaries* 3, oblong, densely pale yellowish sericeous, with many ovules in two rows: style short, stigma bifid, sub-capitate. *Ripe carpels* 1 or 2, elongate, terete, tapering to the apex, pubescent or puberulous, nearly 1 in. long and only ·2 in. in diam.

Perak: on Ulu Bubong, elevat. 400 to 600 feet. King's Collector, No. 10633.

A species resembling *A. sub-dehiscens* in its narrow cylindric fruit.

6. *ALPHONSEA CURTISII*, King, n. sp. A scandent shrub: young branches yellowish-pubescent, speedily becoming glabrous and dark-coloured. *Leaves* coriaceous, oblong-lanceolate, acute at base and apex; upper surface glabrous shining, the lower minutely, sparsely adpressed-puberulous or glabrous, darker than the upper when dry, minutely reticulate; main nerves about 12 to 15 pairs, sub-horizontal, very faint, inter-arching far from the edge; length 4 to 5·5 in., breadth 1·2 to 1·75 in., petiole ·2 in. *Peduncles* extra-axillary, 1- or 2-flowered; flowers about ·5 in. long, conical in bud: pedicels about ·3 in. long, tawny-tomentose; bracteoles 1 or 2, sub-orbicular. *Sepals* connate into a spreading cup, ·25 in. broad, tomentose outside and glabrous inside, with 3 broad, sub-acute teeth. *Petals* much larger than the sepals, fleshy, oblong, ovate, sub-acute; the outer tomentose on both surfaces, ·4 in. long; the inner narrower, glabrous inside. *Stamens* numerous, with short thick filaments: apical process of connective small, not concealing the short perfectly dorsal anther-cells. *Pistils* about 3, oblong, tomentose, many-ovuled: stigma large, broad, sessile. *Ripe carpels* unknown.

Penang: Curtis, No. 1410.

25. KINGSTONIA, H. f. and T.

Trees. *Flowers* fascicled on cauline tubercles, bisexual. *Sepals* 3, persistent, ovate, acute, the bases connate. *Petals* 6; outer valvate; inner smaller, oblong, imbricate. *Stamens* about 12, the filament half the length of the extrorse anther-cells; connective obliquely truncate. *Ovary* 1; stigma sessile, peltate, crenate: ovules few. *Ripe carpels* globose. *Seeds* several, 2-seriate.

1. KINGSTONIA NERVOSA, Hook. fil. and Thoms. Fl. Br. Ind. I, 93. Young branches rusty-pubescent. *Leaves* thinly coriaceous, oblong, rarely elliptic, shortly acuminate, the base rounded; both surfaces glabrous, the nerves and midrib puberulous beneath when young; main nerves 12 to 14 pairs, oblique, rather straight, depressed on the upper, strong and prominent on the lower, surface; length 4 to 8 in., breadth 1.5 to 3.25 in.; petiole .4 in., puberulous. *Flowers* .25 in. long, in extra-axillary fascicles of 8 or 10: pedicels .35 to .5 in., slender, rusty-pubescent; bractcoles orbicular, one close to the flower, the others basal and imbricate. *Sepals* ovate, connate at the base, spreading, pubescent outside, glabrous within. *Outer petals* oblong-elliptic, concave, obtuse, cinereous-tomentose outside, pubescent inside; *inner petals* smaller, thick, concave and very tomentose, in the upper half. *Stamens* about 15, the connective with a broad truncate apex. *Ovary* one, oblong, angled, pubescent; ovules 4 to 6. *Ripe carpels* broadly ovoid, blunt, minutely velvety pale-rusty tomentose, 1.5 in. long and 1.1 in. in diam.; pericarp woody. *Seeds* about 4, oblong, compressed, separated by dissepiments.

The species above described has only a single pistil. But there are, in the Calcutta Herbarium, specimens from Sumatra (Forbes No. 2713, in fruit but without flower) of what appears to be a second *Kingstonia*, and in these there are two carpels. If this plant proves to be a *Kingstonia*, the diagnosis of the genus will have to be amended.

Malacca: Maingay, (Kew Distrib.) No. 22. Perak: Wray, No. 3376.

26. MEZZETTIA, Beccari.

Trees. *Flowers* small, greenish, axillary or from the axils of fallen leaves, fasciculate or umbellate. *Sepals* 3, ovate, valvate. *Petals* 6, valvate, opening late and accrescent, flat, linear, the inner petals smaller than the outer. *Stamens* 9 to 12, in two rows; anther-cells lateral, introrse; connectives produced beyond their apices, truncate. *Torus* small, slightly concave, pubescent. *Ovary* solitary, ovate, glabrous, contracted into a very short style; stigma sub-capitate; ovules 2, superposed. *Carpel* coriaceous, elliptic or globose. *Seeds* 2, large, compressed. Five species, all Malayan.

1. *MEZZETTIA LEPTOPODA*, Oliver in Hook. Ic. Pl. t. 1560. A tree : young branches dark-coloured, glabrous, striate, rather stout. *Leaves* coriaceous, oblong or narrowly elliptic, obtusely acuminate or acute ; the base rounded or acute ; upper surface glabrous, shining ; the lower dull, obscurely reticulate ; main nerves 8 or 9 pairs, forming wide arches far from the margin, very faint ; length 2·5 to 4 in., breadth 1 to 1·75 in., petiole ·35 in. *Flowers* ·5 in. long, on long slender pedicels in axillary fascicles of 2 to 6 ; pedicels ·5 to ·75 in., pubescent : bracteoles minute. *Sepals* broadly ovate, connate at the base, tomentose, reflexed. *Petals* tomentose, on both surfaces ; the outer linear, obtuse, ·2 in. long ; the inner shorter and broader. *Ovary* ovoid. *Ripe carpels* unknown, *Loucomera leptopoda*, H. f. and Th. Fl. Br. Ind. I, 94.

Malacca : Maingay (Kew Distrib.) No. 102.

This plant is very imperfectly known. The carpels associated with Maingay's specimens do not agree with his description of them (Fl. Br. Ind. I, 94) and they are evidently those of some species of *Polyalthia*.

2. *MEZZETTIA HERVEYANA*, Oliver Hook. Ic. Plant. t. 1560. A tree ; young branches rather stout, nodose, glabrous. *Leaves* coriaceous, elliptic-oblong, shortly acuminate, the base cuneate, both surfaces glabrous, the upper shining ; main nerves about 10 pairs, spreading, inter-arching within the margin, faint ; length 2·5 to 3 in., breadth 1 to 1·25 in., petiole ·25 to ·35 in. *Flowers* ·4 in. long, rather crowded, in sessile axillary or extra-axillary fascicles of 3 to 8 : pedicels ·3 in. long, puberulous, ebracteolate. *Sepals* broadly ovate, obtuse, connate at the base, pubescent like the petals. *Outer petals* ovate-lanceolate, obtuse, flat, the inner smaller, broadly elliptic, obtuse, the tips incurved. *Anthers* sessile, obovate-quadrate, about 12. *Ovary* oblong, tapering into the style : ovules 2, superposed. *Ripe carpels* unknown.

Malacca : Hervey.

3. *MEZZETTIA CURTISII*, King n. sp. A tree, 30 to 40 feet high : young branches cinereous, rugose. *Leaves* thinly coriaceous, oblong-lanceolate or oblong, more or less acuminate, the base acute ; both surfaces glabrous ; the upper shining, the lower dull ; main nerves about 10 pairs, spreading, faint ; length 2·5 to 5 in., breadth ·5 to 1·5 in., petiole ·25 in. *Flowers* ·25 in. long, in crowded, sessile, axillary or extra-axillary fascicles of 5 to 10 ; pedicels slender, ebracteolate, scurfily pubescent, ·35 to ·6 in. long. *Sepals* semi-orbicular, with reflexed tips, connate and forming a spreading, shallow cup, densely and minutely tomentose. *Outer petals* ligulate, acute, tomentose like the sepals but with a glabrous patch at the base inside. *Inner petals* like the outer, but less acute and one-third shorter. *Stamens* about 12, short, about as broad as long, the connective very broad, truncate at the apex. *Ovary* solitary, broadly ovoid,

tapering to the curved, truncate stigma, 2-ovuled. *Ripe carpels* unknown. Penang, on Government Hill at 1,200 feet; Curtis, No. 2266.

A species with rather longer, thinner leaves than *M. Herveyana*, and a different calyx.

II.—*Noviciæ Indiæ V.* *An undescribed Mezoneuron from the Andaman Group.*—By D. PRAIN.

When in the Andamans in 1889 and again in 1890 and 1891 the writer met with a species of *Mezoneuron* which occurs rather frequently in the neighbourhood of Port Blair and which has not hitherto been described. During each of these visits only fruiting specimens were obtained; at length, however, the native collectors who are under the care of Mr. E. H. Man have sent flowering specimens to Calcutta. The subjoined synopsis, in which the position of the new species among the Indian *Mezoneura* described by Mr. Baker, in the *Flora of British India*, 257–259, is shown, is followed by a description of the plant.

MEZONEURON, DESF.

Calyx deeply cleft, disk basal (§ EUMEZONEURON)

filaments hirsute:—

 pods one-seeded, filaments faintly ciliate;

 leaflets glabrous, rigid, opposite, 8–10,

 large, ovate, acute; calyx glabrous ... *M. cucullatum*.

 pods several-seeded, filaments densely pilose:—

 leaflets glabrous:—

 leaflets rigid, alternate, 8–10, large,

 obovate, retuse; calyx glabrous

 ... *M. andamanicum*.

 leaflets membranous:—

 leaflets alternate, 14–16, small,

 oblong, obtuse; calyx exter-

 nally puberulous ...

 ... *M. glabrum*.

 leaflets opposite, 18–22, small,

 oblong, obtuse; calyx glabrous

 ... *M. enneaphyllum*.

 leaflets pubescent; membranous, opposite,

 12–16, oblong, obtuse; calyx externally

 and internally pubescent ...

 ... *M. pubescens*.

Calyx shallowly cleft, disk extending above the

 base (§ TUBICALYX); filaments glabrous, pods

 several seeded; leaflets glabrous, rigid, opposite,

 8–10, large, obovate-oblong; calyx glabrous ...

 ... *M. sumatranum*